# Amor2-14CRVM

## NP900X4D

# SERVICE MANUAL

**NP900X4D**

**Contents**


1. Precaution
2. Introduction
3. Desassembly and Reassembly
4. Trouble shooting
5. System Wire Diagram


Refer to the service manual in the GSPN (see the rear cover) for more information.

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# 1. Precaution

## 1.1. General After-Sales Service Precautions

1) Do not let customers repair the product themselves..

   › There is a danger of injury and the product life time may be shortened.

2) Make sure to disconnect the power cord from the wall outlet before repairing the product (especially for after-sales service of electric parts).

   › There is a danger of electric shock.

3) Do not let customers plug several electric home appliances into a single wall outlet at the same time.

   › There is a danger of fire due to overheating.

4) Check if the power plug or wall outlet are damaged in any way.

   › If a defect is found, repair or replace it immediately.
   (There is a danger of electric shock or fire)

5) Make sure that it is properly grounded.
   (Check the ground of the wall outlet)

   › Electricity leakage may cause electric shock.

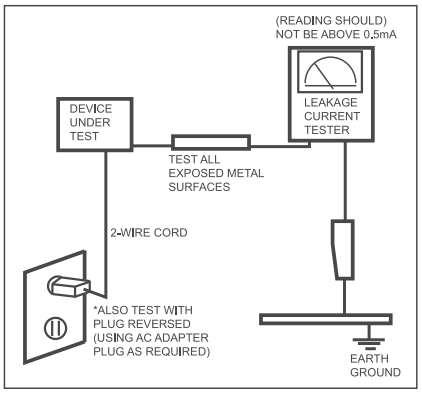


Figure 1.1 Leakage Current Test Circuit

6) Do not spray water on to the product to clean it.

   › There is a danger of electric shock or fire and it may shorten the lifetime of the product..

7) Check the assembly status of the product after the after-sales service..

   › The assembly status of the product must be the same as before the after-sales service.

8) Unplug the power cord holding the power plug (and not the cord).

   › If the cord is disconnected, it may cause electric shock or fire.

9) Repair the product using only authorized parts

10) Keep the product away from heating devices such as heaters.

   › Exposure to heaters may cause deformation of the product or fire.

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# 1.2. Safety Precautions

1) **EMI**

This device has been registered regarding EMI for residential use. It can be used in all areas.

2) **Circuit Test (Logic Test) Precautions**

The LSI and MSI used in this product are semiconductor integrated circuits based on MOS-FET or CMOS. Since these types of devices are highly susceptible to static electricity or current leakage, an isolation break may be caused. Therefore read and follow the instructions below.

a) When handling an LSI or MSI, make sure your body is grounded through a few mega-ohms of resistance. In addition, wear gloves and a jacket made of cotton and not of synthetic fibers that easily generate static electricity.

b) When repairing the product, place a conductive material (e.g. aluminum foil) grounded to the earth on the worktable.

c) You must use a soldering iron without a leakage current.

d) Do not touch the pin of an IC and carefully insert the IC into the black plastic package.

e) When inserting an IC into a PCB, be careful with the direction of the IC. When installing an IC in the wrong direction, it might become damaged.

f) When carrying an IC, package the IC with conducting material such as aluminum foil or conducting sponge so as to keep the voltage level of each of the terminals the same.

g) Since the storage temperature of an IC is between -20 ~ +70 degrees, keep it at room temperature, if possible.

h) Since the storage temperature of an IC is between -20 ~ +70 degrees, keep it at room temperature, if possible.

i) When soldering an IC, solder it in as short a time as possible so that unnecessary heat is not applied to the device.

j) Avoid leaving excessive amounts of flux within a custom IC or between the pins when soldering a custom IC.

k) Take care to not damage the board when installing or separating an Option Board.

l) Take care to not break the printed circuit pattern on the PCB when separate an IC.


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# 1.3. Ground

The product must be grounded to protect it from static electricity and other dangers. When using a multitap, please use a multi tap with a ground terminal only.

If you use a 220V wall outlet with a ground terminal, you do not need to ground it additionally. Avoid using wall outlets if they are not grounded even if they have a ground terminal.

To ground the product, connect the ground to an exclusive ground terminal or metal water pipe. Connect the ground cable to the ground terminal at the rear of the main body. To ground the product, connect the ground terminal of the product to a metal water pipe, wall outlet or exclusive ground terminal with an electric wire equal to or thicker than #18.

Never ground the product to a PVC water pipe, phone line, TV, radio antenna, aluminum window or gas pipe, because this does not actually ground the product and may be dangerous.

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# 1.4. Static Electricity Precautions

Many parts of the system are susceptible to static electricity. Using an electrostatic discharge (ESD) device is very important for the safety of the user and the user's surroundings. Using an ESD device increases the probability of a successful repair and lowers the expenses for damaged parts.

To prevent static electricity, follow the instructions below.

1) Perform the repair in a location without static electricity.
2) Touch your hands to a metal water pipe or some metal object connected to the ground to discharge any static Electricity from your body before handling the parts.
3) Touch only the edges of the board, if possible.
4) Do not touch any parts unless absolutely necessary
5) Disassemble the parts on the anti-static-electricity pad.
6) When a board is not installed in the system, package the board with an anti-static-electricity packaging.


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# 2. Introduction

## 2.1. Product Features

**Thinnest Beauty that represents your Class**

Target Customer:
Premium

Key Buying Factors
- Brand, Design
- Cutting-edge technology
- Light weight, slim and small chassis
- Long-lasting battery life

**Stand out from the crowd**
(Aero-Dynamic DI, AL Body, Matt Finishing, Slim Bezel, Ash Color)

**Carry wherever you go**
(14.9mm, 1.6kg, 50% Smaller, 10hrs battery life)

**Save your Time & Energy**
(10s boot, 2s start, 5s Resume, 8GB RAM, Backlit KBD, Roomy T/P)

**Enjoy vivid content wherever you go**
(Only 15" w/ 400nit,16M color depth, 60% color gamut, HD+, AG)

| Short Specifications | |
|---|---|
| LCD: | 15" Super bright Plus @ 400nit HD+ (1600 x 900) |
| O/S: | Genuine Windows® 7 Home Premium |
| CPU: | Intel Dual Core i5/i7 ULV Processor |
| VGA: | Intel HD Graphics 4000 (Chief River) |
| Storage: | 128 ~ 256GB SSD |
| ODD: | None |
| Ports: | 2xUSB 3.0, 1xUSB 2.0, 4-in-1 Reader, micro HDMI, VGA(Dongle), LAN, HP/MIC |
| LAN: | 10/100/1000 Gigabit Ethernet LAN |
| Wireless: | 802.11 abg/n, BT4.0 |
| Battery**: | Li-Polymer 62Wh |
| Weight: | 1.6Kg |

***Thinnest Beauty* that Represents Your Class**

Perfect Mobile Performance
- World's Thinnest & Smallest
- Strongest in any place
- Best Viewing wherever You go

Exclusivity
- Inventive Design
- Premium Accessories & Options

Save your Time & Energy
- World's Fastest Readiness
- Expansive Screen Estate
- Smart & Convenient Functions

**PREMIUM BRAND IMAGE LEADING**

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# 2.2. Specification

| | |
|---|---|
| **Processor and Motherboard** | |
| **CPU** | Intel IvyBridge_BGA Type - Non<br>Upgradable Max spec<br>Intel® Core™ i7 Processor 3517U<br>(1.9GHz, 4 MB)<br>Intel® Core™ i5 Processor 3317U<br>(1.70Hz, 3 MBL3 Cache) |
| | |
| Cache | L3 : 3~6MB |
| Chipset | Intel HM75 |
| BIOS | 64 Mbit SPI flash |
| Thermal Design Performance | All 17W |
| **Memory** | |
| **Memory / Max. Memory** | PC3-1066S(1333MHz),PC3-12800S(1600MHz), 2-slot SODIMM Min. 4 GB ~ Max. 8 GB |
| Memory type | 1333MHz/1600MHz DDR3 2-Slot SODIMM |
| Memory Modules | 2 GB SODIMM, 4 GB SODIMM (1-Slot) |
| Sockets | 2-slot SODIMM's |
| | ※ K4B8G3346B-MCH9 (1333MHz) confirmed the competibility test |
| **Display and Graphics** | |
| **LCD** | 15.0" SuperBright 400nit HD+ LED Display (1600 x 900), Anti-Reflective |
| Type | LED LCD with Anti Glare (=Non Glare) |
| Panel | TN Mode |
| LCD Viewable Area | 332.4 (H) x 186.975 (V) |
| LCD Resolution | HD+ (1600x900)<br>Win7 Support:(1600X900, 1366 X 768, 1280 X 720,<br>1024 X 768, 800 X 600)<br>XP Support :(1600X900, 1366 X 768, 1280 X 720,<br>1024 X 768, 800 X 600) |
| Dot Pitch | 0.20775(H) x 0.20775(V) Mm |
| Viewing angle | 45/45/15/30 (L/R/U/D) |
| Opening angle | 135 |
| Reflection Rate | Haze 25 |
| Contrast Ratio | Typ.500 |
| Brightness | typ.400 (cd/m2) |
| Response time | AM: Rising + Falling typ. 16ms |
| | |
| **Graphics Controller** | Intel HD Graphics 4000 |
| Video Memory | Shared memory (Int) Graphics set in the BIOS setting : 64MB Windows boot : 1696MB |
| GPU TDP | Max.17W (CPU Integrated) |


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| | |
|---|---|
| Max.Resolution for LVDS | dual link resolution of 2560x2048 per link / a maximum theoretical pixel rate of 224 MP/s MAX 2560x2048 (640x480,800x600, 1024x768, 1152x864, 1280x800,1280x960, 1280x1024, 1400x1050, 1440x900,1600x1024,1600x1200, 1680x1050, 1920x1200, 2560x2048) [Ext.monitor resolutions supported by EDID information] |
| Max. resolution for VGA | Max resolution of 2560x1600 at 85Hz refresh rate (ext.) Supported resolution MAX 2560x1600 (640x480,800x600, 1024x768, 1152x864, 1280x800,1280x960,1280x1024, 1400x1050,1440x900,1600x1024,1600x1200, 1680x1050, 1920x1200, 1920x1440,2560x1600) [Ext.monitor resolutions supported by EDID information] |
| Max. resolution for HDMI | Support v1.4a compliant / a resolution of 1920x1200 pixels with 32-bit color at 60 Hz [Ext.monitor resolutions supported by EDID information] |
| Controls | Keyboard Brightness Control |
| **Audio and Video** | |
| **Sound** | Realtek High Definition Audio |
| Controller | HD Audio Codec, ALC269Q-VC-GR |
| Conversion | Built-in high performance 24-bit ADC & 24-bit DAC |
| Internal Interfaces | Embedded stereo speakers, Internal Array MIC |
| Speaker Power Rating | 2 Speakers x 2.0 Watt with enclosure each |
| External Interfaces | Microphone, Headphone, Combo Jack Support( 4Pole Combo : MIC/GND/SPK/SPK = Apple's approach), SPDIF NOT SUPPORT |
| Controls | Keyboard volume control, Side Volume button |
| Sound effect | Sound Alive |
| | |
| **Microphone** | 3pole Mic/ HP combo |
| Type | Array Mic : DIGITAL SMD type dual array mic (Main board / Camera) |
| Sensitivity | -26dBFS [0dB=1V/Pa, at 1KHz] |
| S/N Ratio | 56(min) Db |
| | |
| **Camera** | |
| Model name | SC-13HDL11624N (IMX119P + SPCA2088) |
| Image sensor | 1.3 Mega CMOS color image sensor |
| Still Image Capture Resolution | 1280*1024(Max.), 1280*720, 800*600, 640*480, 352*288, 320*240, 176*144, 160*120 |
| Video Capture Resolution | 1280*1024(Max.), 1280*720, 800*600, 640*480, 352*288, 320*240, 176*144, 160*120 |
| Frame Rate | Max 30fps @ 1.3M |
| Output Video Format | YUY2, MJPEG |
| Interface | USB 2.0 |
| UVC Support | Compliant with USB Video Class |
| **Storage** | |
| Type | mSATA (mini PCIe type) |
| Solide Stae Disk | SATA2 3.0 Gbps / SATA3 6.0Gbps |
| Supports | up to ATA/ATAPI-7 standard |

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| | |
|---|---|
| Capacity | MAX. 256GB ,128GB |
| Size | 30*51*3.8mm, W*L*H |
| NAND | MLC |
| | |
| **Optical Driver Modules (Share)** | |
| Optical Disk Driver(Option) | Ext. ODD : AA-ES3P95M |
| Spec | TS-U633J/SCEFZ,8X,170MS,USB,1.5MB,7.5W,5V, Blueblack |
| Type | Half-Finished Type 5902, |
| Speed | 5x DVD-RAM, 8x DVD±R, 6x DVD±R DL, 8x DVD+RW, 6x DVD-RW, 24x CD-R/RW, 8x DVD, 24x CD |
| Weight | 130g or less |
| **Network Tools (Share)** | |
| LAN | 10/100/1000 Gigabit Ethernet LAN |
| | RTL8111E, RJ45 output |
| | |
| Combo module | Intel Centrino@Advanced-N 6235<br>Jackson Peak2 (BA59-03294A) |
| Spec | 6235AN.HMWG,-,2x2,Half MiniCard STD,IEEE 802.11a/g/n,26.8*30.0 |
| Type | 2X2 WLAN/BT combo module, 802.11 abg / Bluetooth 4.0 (WIDI support) |
| Max. Link Speed | 300Mbps (Link Speed is only standard value, Actually value will decided by each environmant) |
| Chipset | Jackson Peak2 |
| Antenna | 2 Antenna Support : WLAN (2TX, 2RX), BT(1TX/RX) |
| **I/O Interface (Share)** | |
| **Multi Card Slot** | 4-in-1 (SD, SDHC, SDXC, MMC) |
| vendor | Jingshi |
| Max. support capacity | 64GB ( comfirm of the competibility test ) |
| | |
| **I/O Ports** | |
| USB Port | 1 x USB 2.0 port (Chargeable, support iphone), 2 x USB 3.0 ports |
| VGA Port | 1 x VGA dongle port<br>[VGA dongle is option sale.] |
| Audio Jacks | 1 x 3.5mm Combo(HeadPhone-out, MIC-in) |
| LAN | 1x LAN dongle port |
| TV | 1x Combo(4 pole, HeadPhone-out, MIC-in)<br>[Micro HDMI to VGA dongle is not supported.] |
| Dock | None |
| Security | None |
| Power | 1x DC-in jack(3Pie)for AC adapter |
| | |


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| | |
|---|---|
| **Input Devices** | |
| Key board | 1.35mm stroke 3.4 mm height / Backight KBD (EL sheet) |
| Touchpad | W98*H67.3*T0.3, PET type Click pad, Multi finger gesture |
| **Security Solution** | |
| TPM | Trusted Platform Module 1.2 |
| Interface | LPC |
| Chip | SLB 9635 TT 1.2 (infineon) |
| Security software | TPM Host SW |
| **Power and Power Management** | |
| **Power and Power Management** | |
| **System power management** | |
| Power management features | ACPI V2.0 compliant, Standby(S3), Hibernate(S4) |
| | |
| Standard battery | |
| Model code | AA-PBXN8AR |
| Type | Li-Polymer |
| Details of cell | 8 cells |
| Battery capacity | 8400mAh |
| Voltage | 7.4V |
| Battery rating | 60Wh |
| Color | Black |
| Dimension | 309x139.4x5.6mm (W X D X H) |
| Weight | appox. 360 g |
| Recharge time | appox. 3.3 hours |
| | |
| AC Adapter | AD-4019P |
| Output Power | 40W |
| Dimension | 94 X 67 X 17mm (W x H x D) |
| Weight (AC Adapter) | 250g (Max) |
| Worldwide Compatibility | Auto-sensing 100 - 240VAC |
| Line Frequency | 50 / 60Hz |
| Adapter Rating - Input | 90V - 264V, 1.0A |
| Adapter Rating - Output | 19.0VDC / 2.10A |
| **System Dimensions** | |
| Dimensions (W X D X H) | 356.9 x 237.0 x 14.9 mm |
| Weight | 1.6Kg |
| - Term | Full System with 8 cell Battery |
| Packing Size(W X D X H) | With Option : 491 * 317* 112<br>With out Option : 491 * 317* 112 |
| Design | |
| LCD Back | Mg + Teflon Coating |
| LCD Front | Al, Sanding + Anodizing |

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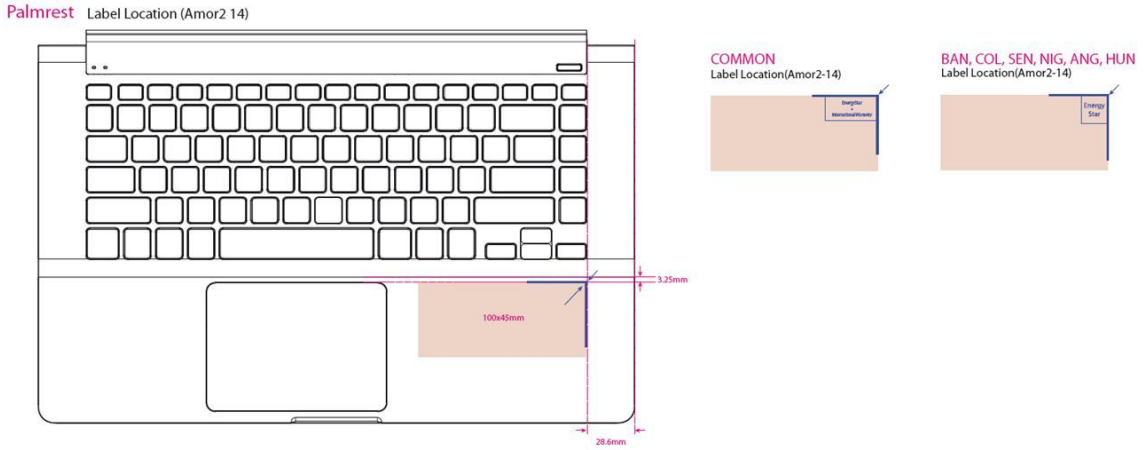
| | |
|---|---|
| System Top | Mg + Teflon Coating |
| System Bottom | Al, Sanding + Anodizing |
| Protection film | On Palmrest, LCD back |
| **XP Driver** | XP Driver ready, There is no plan to sell |
| | |
| **XP TRIM** | Do not support |

※ TRIM, which purges data from the SSD's cells upon deletion and can prevent the slowdown that many solid state drives experience after prolonged use, is generally considered to be the best thing to have happened to the devices for quite some time.

**Location labeling**





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# 2.3. Comparing product specifications

| Item | Amor2-14 | Apple Macbook Air 13.3"('11) | Amor13 (NT900X3A-A51) |
|---|---|---|---|
| MODEL | | | |
| LCD | 15" 400nit HD+ | 13.3" 300nit HD | 13.3" 400nit HD |
| CPU | Intel CRV Ivy Bridge | Intel HRV Sandy Bridge | Intel HRV Sandy Bridge |
| Chipset | Panther Point | Cougar Point | Cougar Point |
| Memory | 2 SoDimm, Up to 8GB | On Board 2GB, Up to 4GB | 2 SoDimm, Up to 8GB |
| Graphics | Internal Gfx. | Internal Gfx. | Internal Gfx. |
| HDD | m-SATA 128GB/256GB | Flash Memory (128GB/256GB) | m-SATA 128GB/256GB |
| Comm. | 802.11bgn/BT4.0 Combo | 802.11abgn, BT 4.0 | GB Ethernet, 802.11 bgn, BT3.0 |
| Port | 2xUSB 3.0, 1xUSB2.0, VGA Dongle, m-HDMI, HP/Mic Combo, Normal SD, LAN Dongle, DC-in | Thunderbolt, DC in, HP, 2xUSB2.0, Normal SD | 1xUSB3.0, 1xUSB2.0, m-HDMI, HP/Mic Combo, Micro SD, LAN Dongle, DC-in |
| Keyboard | Island, 19.05mm Pitch (1.35mm stroke, Backlit) | Island, 19.05mm Pitch (1.5mm stroke, Backlit) | Island, 19.05mm Pitch (1.8mm stroke, Backlit) |
| Battery | 62Wh (8cell) | 50Wh (4cell) | 46Wh (6cell) |
| CMF | A/C – Al 5052<br>B – Al Metal Sheet 0.3t | Aluminum Unibody | A – Duralumin / B – Flat Window<br>C – Aluminum / D - Magnesium |
| Size(WDH) | 356.9 x 237.0 x 14.9 mm (1,260,320.97 $mm^3$) | 325 x 227 x 3~17mm (1,254,175$mm^3$) | 328.5 x 227.0 x 15.9 ~ 16.3 mm (1,215,482$mm^3$) |
| Weight | 1.6kg | 1.35kg | 1.31kg |

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# 2.4. Function of Product

## Front View

- The pictures used for the cover and the main body in the User Manual are those of the representative model of each series. Therefore the colors and appearance of the pictures may differ from the actual appearance of the product depending on the model.
- The actual color and appearance of the computer may differ from the pictures used in this guide.
- This may not be supported for some devices.

| | | |
|---|---|---|
| 1 | Camera (Optional) | Using this camera, you can take still pictures and record video. |
| 2 | Camera operating indicator | This indicates the camera operating status. |
| 3 | LCD | The screen images are displayed here. |
| 4 | Status Indicators | Shows the operating status of the computer.<br>The corresponding operating LED is lit when the corresponding function operates. |
| 5 | Power Button / Power Button LED | Turns the computer on and off.<br>When the computer is on, the power button LED is lit. |
| 6 | Keyboard | A device to enter data by pressing the keys. |
| 7 | Touchpad/ Touchpad Buttons | The touchpad and touchpad buttons provide functions similar to the mouse ball and buttons. |

**Using the camera, web cam (Optional)**
Using the Cyberlink YouCam program (optional), you can take pictures or record video by using the computer's built-in camera by adding the balloon talk or frame effect.

## Status Indicators

| | | |
|---|---|---|
| 1 | Charge Status | This shows the power source and the battery charge status.<br>● **Green:** When the battery is fully charged or the battery is not installed.<br>●/● **Red** or **orange:** When the battery is being charged.<br>● **Off:** When the computer is running on battery power without being connected to AC adapter. |
| 2 | Illumination Sensor (Optional) | This sensor detects the ambient illumination of the PC.<br>If the ambient illumination becomes dark, the LCD becomes dimmer and the keyboard backlight is lit.<br>On the contrary, if the ambient illumination becomes brighter, the LCD becomes brighter and the keyboard backlight is turned off.<br>Press the Fn + F1 keys simultaneously, select the **Easy Settings** > **Display**, and select or unselect the check box to turn the illumination sensor ON/OFF. |


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## Right View

| | | |
|---|---|---|
| 1 | Multi Card Slot | A card slot supports multi cards. |
| 2 | Monitor Port | A port used to connect a monitor, TV or projector supporting a 15pin D-SUB interface.<br>You can connect a VGA adapter (optional). |
| 3 | USB 3.0 Port | You can connect USB devices to the USB port such as a keyboard/mouse, digital camera, etc. |

## Left View

| | | |
|---|---|---|
| 1 | DC Jack | A jack to connect the AC adapter that supplies power to the computer. |
| 2 | Chargeable USB 2.0 Port | This is a chargeable USB port that can be used to connect and charge a USB device.<br>When the AC adapter is connected, it may be inconvenient to use the USB port.<br>In this case, purchase and use a USB extension cable or use the USB ports on the right side. |
| 3 | Ear-set / headset Jack | This is the jack for connecting an ear-set or headset. |
| 4 | Micro Digital Video / Audio Port (Micro HDMI) (Optional) | This is the port for a micro HDMI.<br>You can enjoy digital video and audio by connecting the computer to a TV. |
| 5 | Wired LAN Port | Connect the Ethernet cable to this port.<br>You can use wired LAN by using the LAN adapter (Optional). |
| 6 | Microphone | You can use the built-in microphone. |

**What is a chargeable USB port?**

- USB device accessing and charging functions are supported.
- The USB charging function is supported regardless of whether the power is turned on or off.
- Charging a device through a chargeable USB port may take longer than general charging.
- Using the Chargeable USB function when the computer is running on battery power reduces the battery usage time.
- The user cannot evaluate the charging status of the USB device from the computer.
- This may not be supported for some USB devices.
- You can turn the Chargeable USB function **ON/OFF** by selecting the **Easy Settings** > **General** > **USB Charging** option. (Optional)

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## Bottom View

| | | |
|---|---|---|
| 1 | Battery Emergency Hole | This hole is to cut the power supply to the battery. Insert and press one end of an unfolded paper clip into the hole it to cut the power to the battery.<br>For more information, refer to **About the function to cut the power supply to the internal battery** in the Safety Precautions.<br>The location of the Emergency Battery Hole may differ depending on the model. |
| 2 | Speaker | A device used to generate sound. |

If you replace the bottom of the product, the model name, serial number and some logos etched into the bottom of the product will no longer be there.
For more information, please ask for assistance from the service center.

**[Amor2-14CRVM Bottom case replace guideline]**

**1) Notice**
**- Amor model has no S/N attached, it is laser printed.**

**- Laser printing work is impossible when replacing Bottom case,**

**- Please follow the guideline below when replacing Bottom case**

**2) How to replace Bottom case**
**- Find two S/N labels attached inside of Bottom case**

**- Remove two S/N labels when replacing the Bottom case**

**- Give one S/N label to the customer and guide them to attach it on their warranty card. Attach the other S/N label inside of Bottom case**

**※ Unable to read S/N on the exterior of the product if the Bottom case is replaced.**


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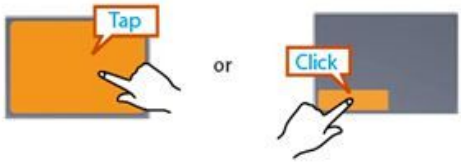
# Touch pad

### Click Function

Place a finger on the touchpad and click on an item once.

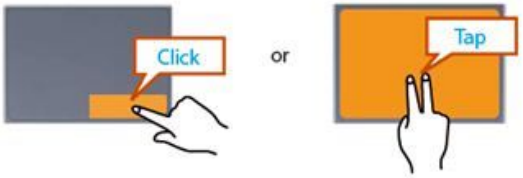
Alternatively, press the left button once quickly and release it.




### Right Button Function

This corresponds to clicking the right mouse button.

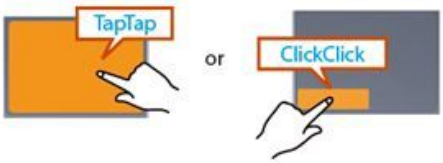
Touch the right touchpad button once or touch the touchpad once with two fingers to open the context-sensitive menu.




### Double-Click Function

Put your finger on the touchpad and quickly tap twice with your finger on an item you want.

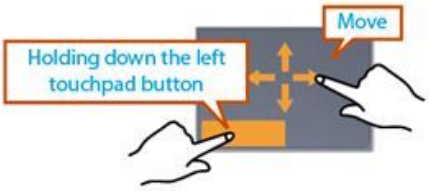
Alternatively, press the left touchpad button twice quickly.




### Drag Function

Dragging refers to moving an item to another place after selecting it.

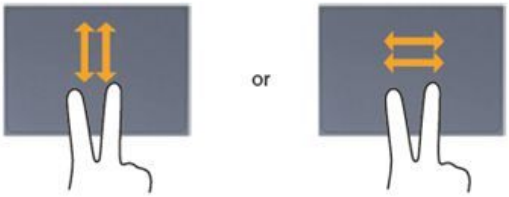
Press and hold down the left touchpad button over an item you want to drag and move the item to the new location.




### The Scroll Function

This function is the same as the scroll area of the Touchpad.

If you place two fingers over the Touchpad and move them up, down, left or right, the screen is scrolled up, down, left or right accordingly.



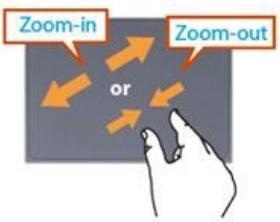

### Page Move Function

You can move to the previous or next page when you are looking at a photo or surfing the Internet.

For example, if you lightly brush three fingers to the left while you are looking at a web site, you will return to the previous page.

### Zoom Functions

If you place two fingers over the Touchpad together or apart, the current image or text is zoomed in or out.

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# Keyboard

**※ Keyboard arrangement and size can differ to by each country.**

Shortcut key functions and procedures are discussed in the following sections.

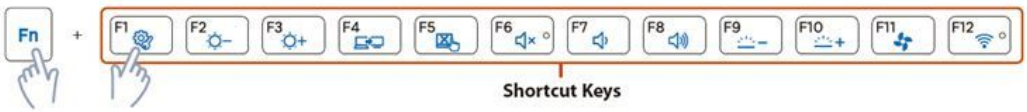
- The keyboard image may differ from the actual keyboard.
- The keyboard may differ depending on your country. The following mainly describes the shortcut keys.

## Shortcut Keys

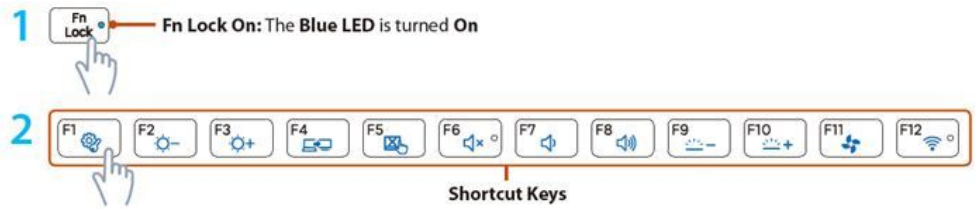
Press both the **Fn** key and hot key at the same time.

Alternatively, press the **Fn Lock** key as well as a hot key to use the hot key functions more easily.

► **Method 1**




► **Method 2**





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| Shortcut Keys | Name | Function |
|---|---|---|
| F1 | Easy Settings | The Samsung software control program, the **Easy Settings**, is launched. |
| F2 F3 | Screen Brightness Control | Controls the screen brightness. |
| F4 | CRT/LCD | Switches the screen output to the LCD or external monitor when an external monitor (or TV) is connected to the computer. |
| F5 | Touchpad | Turns the Touchpad function on or off.<br>When using an external mouse only, you can turn the Touchpad off. |
| F6 | Mute | Press this button to turn the audio on or off. |
| F7 F8 | Volume Control | Controls the volume. |
| F9 F10 | Keyboard Backlight Brightness Control | When it is dark or when the illumination sensor is turned off, you can manually control the brightness of the keyboard backlight.<br>• If you use the buttons in a bright location, the "The keyboard backlight brightness cannot be changed due to too bright ambient illumination" message appears.<br>• When it is bright or the illumination sensor is turned on, select **Easy Settings** > **General** > **Keyboard Backlight** and adjust the backlight brightness. |
| F11 | Silent Mode | Reduces the Fan noise so that users can use the computer without hearing noise. |
| F12 | Wireless Network | The wireless network configuration program starts and you can turn the wireless network device on or off. (Only for models with a wireless network device.) |

### Other Function Keys (Optional)

- Performs the right-click mouse function (touchpad).

- If you press the **Fn Lock** key, you can use the hot key functions without pressing the **Fn** key.

If the hot keys do not work properly, you have to install the **Easy Settings**.

### Keyboard Backlit Function (Optional)

The keyboard Backlight are automatically turned on or off depending on the ambient illumination. Therefore, you can easily type with the keyboard when you are in a dark environment or at night.

**To adjust the keyboard backlit brightness**

Press the Fn + F1 key combination to launch **Easy Settings** and select **General** > **Key Backlit** and adjust the brightness.

The representative figure of the keyboard has been used, but they may differ depending on the country or the model.

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# 2.5. New Technology / ability

## Inner battery

Please refer to the following instructions when running the computer on battery power without connecting the AC power.

This computer is equipped with an internal battery.

**Precautions**

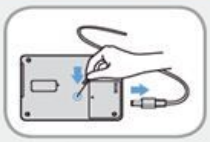
- **Users cannot remove or replace the internal battery.**
- **To remove or replace the battery, use an authorized service center in order to protect the product and users. You will be charged for this service.**
- Use only chargers specified in the User Manual.
- Never heat the battery pack, put it near or in a fire or use at a temperature higher than 60℃, as this may cause fire.
- Please refer to the system operation environment of this manual and operate and store the battery at room temperature.

- Before using the computer for the first time, make sure to connect the AC adapter and charge the battery completely.
- The images used for the illustration are of a representative model, therefore the images may differ from the the actual product.

The location of the internal battery

**Battery replace method refered to User Manual** Reference data

**Cutting the power to the internal battery (for corresponding models only.)**



- For products with built-in batteries, customers cannot remove the battery.
- In the case of flooding, lightning or explosions, you can cut the battery power by inserting an object such as a paper clip into the [Emergency Hole] at the bottom of the computer.
- Disconnect the AC adapter and insert an object such as a paper clip into the hole at the bottom of the computer to cut the battery power.

**In the case of flooding, lightning or explosions, cut the battery power, do not reconnect the AC adapter, and immediately contact Samsung Electronics so that the appropriate countermeasures can be taken.**

- Thereafter, if you connect the AC adapter, the battery power will be supplied again.

- **Do not cut the battery power under normal conditions.**
- **This may result in data loss or a product malfunction.**

## KBD Function

### 1. Keyboard Backlit Function

**Keyboard Backlit Function (Optional)**

The keyboard Backlight are automatically turned on or off depending on the ambient illumination. Therefore, you can easily type with the keyboard when you are in a dark environment or at night.

※ BackLit implemented as EL sheet, not the LED.

### 2. Keyboard Function Key

You can use the following functions by pressing the keys below with the **Fn** key.

If you press the **Fn Lock** key and the button LED (Blue Color) is illuminated, you can use the following keys without holding down the **Fn** key.

**If the Wireless network(F12) / Fn Lock / Caps Lock are turned on, the button LED is lit.**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# ALS

| | | |
|---|---|---|
| 2 | Illumination Sensor (Optional) | This sensor detects the ambient illumination of the PC.<br>If the ambient illumination becomes dark, the LCD becomes dimmer and the keyboard backlight is lit.<br>On the contrary, if the ambient illumination becomes brighter, the LCD becomes brighter and the keyboard backlight is turned off.<br>Press the Fn + keys simultaneously, select the **Easy Settings** > **Display**, and select or unselect the check box to turn the illumination sensor ON/OFF. |

# Gesture Pad

1. Title
   - New type Touch Pad is adopted at this model. [Formal title: Gesture Pad]
2. [Touch Pad] vs [Gesture Pad] Appearance difference

[Touch Pad]

Touch Pad is composed with 3 parts]

[Gesture Pad]

[Gesture Pad is composed with one part ]

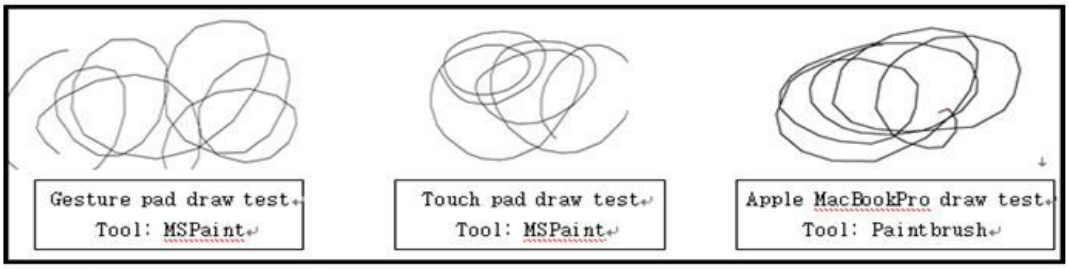
3. [Gesture Pad] Merit

[Touch Pad] – Gesture is supported at only Touch zone.

[Gesture Pad] – Gesture is supported at Gesture Zone and Button Zone.

4. [Gesture Pad] Research result of the sensitivity issue as drawing with drag

. Symptom: The drag function is not natural and it is hard to control the mouse pointer




. Cause: Gesture pad uses 40 times position data per second less than Touch pad uses 80 times position data per second, so moving sensitivity at Gesture pad is lower than at Touch pad because of the less position data.

- Touch Pad : Send 80 times position data per second to Micom
- Gesture Pad: Send 80 times data per second to Micom, 40 times are position data, other times are additional button touch information.

. Research Result: Limitation of Gesture.

(Same symptom was detected at HP Envy series and at Apple MacBookPro)

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**5. [Gesture Pad] Function limitation.**

**■ Button limitation**

Gesture pad has just one switch. Gesture pad scans the button touch location to recognize the left button click or right button click, when the switch is turned on.
If the user clicks at the area excepting the button area, the Gesture pad does not any action.
If the user clicks left or right button when a finger touches at the other side button zone preliminarily, both buttons work at the same time.
Ex)
If the mouse pointer is on the button icon, button icon is selected by the left button click signal.
If the mouse pointer is on the paper wall, the pop-up window is displayed by the right button click signal.
When multi fingers touch at buttonless touch pad, touch pad driver uses addition data packets for implementing the button function. So the position data of the mouse pointer is decreased, it causes the moving of the mouse pointer is not natural.

**■ Gesture limitation**

If one finger touchs the left or right button zone preliminarily, all gestures are not recognized.
Because a finger at the button area is counted when the count of the touch pointer is counted, the gestures are not recognized normally.
So remove all fingers from the button area before gestureing.
All fingers have to start at the gesture area when the two or three finger gestures are started. If one finger starts at the left or right button zone, the gestures are not recognized. Althought the fingers use the button area during gesture, the gestures works.

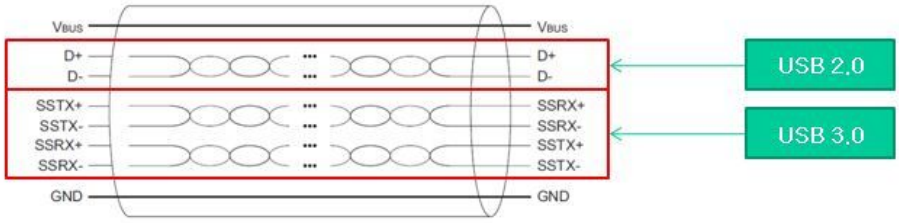
**■ Mouse pointer limitation**

If touch time of the finger is longer than 0.2 second at the button area, the touch action is ignored.
When the finger's movement is ignored, the mouse pointer will not move unless the finger is untouched or the finger moves to the gesture area.

# USB 3.0

| | USB3.0 (SuperSpeed USB) | USB2.0 |
|---|---|---|
| Speed (Data rate) | 5.0 Gbps | Low-speed (1.5 Mbps)<br>Full-speed (12 Mbps)<br>High-Speed (480 Mbps) |
| Data Interface | . 4-wire differential signaling separate from USB2.0 signaling<br>. Simultaneous bi-directional data flows | . 2-wire differential signaling<br>. Uni-directional data flow with negotiated directional bus transactions |
| Cable Signal Count | 4 for SuperSpeed data<br>2 for non-SuperSpeed data | 2 for low/full/high-speed data |

**- USB 3.0 Cable**




**- USB 3.0 has the backward compatibility for USB 2.0**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## USB 3.0 HOST CONTROLLER

### FEATURES

- Compliant with Universal Serial Bus 3.0 specification Revision 1.0, which is released by USB Implementers Forum, Inc
  - Supports the following speed data rate as follows; Low-speed (1.5 Mbps) / Full-speed (12 Mbps) / High-speed (480 Mbps) / Super-speed (5 Gbps)
  - Supports 2 downstream ports for all speeds
  - Supports all USB compliant data transfer type as follows; Control / Bulk / Interrupt / Isochronous transfer
- Compliant with Intel's eXtensible Host Controller Interface (xHCI) Specification Revision 0.96
- Support USB legacy function
- Compliant with PCI Express Base Specification Revision 2.0
- Supports ExpressCard™ Standard Release1.0
- Supports PCI Express Card Electromechanical Specification Revision 2.0
- Supports PCI Bus Power Management Interface Specification Revision 1.2
- Operational registers are direct-mapped to PCI memory space
- Supports Serial Peripheral Interface (SPI) type ROM
- System clock: 24 MHz crystal or 48 MHz external clock.
- 3.3 V and 1.05 V power supply

| Characteristic | SuperSpeed USB 3.0 | USB 2.0 |
|---|---|---|
| Data rate | SuperSpeed(5G.0bit/s) | Low-speed(1.5Mbit/s),<br>Full-speed(12Mbit/s)<br>And High-Speed(480Mbit/s) |
| Signaling | Dual-simplex four wire differential signaling | Unidirectional data flow + negotiated directional bus transitions |
| Data Flows | Simultaneous bi-directional data flow | Unidirectional data flow + negotiated directional bus transitions |
| Cables | 6 Total<br>4 x SuperSpeed<br>2 x non-SuperSpeed | 2 x low,full,high-speed |
| Traffic Flow | Asynchronous | Polled |
| Packet Traffic | Explicitly routed | Broadcast to all devices |
| Power Management | Multi-level which supports idle, sleep, and suspend. | Port-level that has two levels of entry/ exit latency |
| Bus Power | 50% more than USB 2.0<br>80% more with configured power | |

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# Wireless Display

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## Requirements

System: Intel CPU, Intel GFX, Intel WLAN
Software: My WiFi Technology, WiDi S/W, Win7
3rd vendor product: WiDi Receiver (Netgear's Push2TV PVT1000) on TV side

## Versions Supported SPEC

| Feature | 2010 Features | 2011 Enhancements |
|---|---|---|
| Standard HD media codec | •30fps motion video at 720p encode at the PC<br>• Standard MPEG2 codec | • 30fps full motion video at 1080p encode at the PC<br>• Standard H.264 using HW encode |
| Standard Display Output Protection | | • Output protection via HDCP2*<br>• Blu-ray and DVD |
| Display Adapter uses Standards based WiFi | • Adapter using.11bgn 1x1 radio | • Adapter using .11agn 2x2 radio |
| Intel Frame Capture Intel A/V Time Sync | • Graphics driver frame capture for smooth video<br>• Best in class A/V lip-sync with 2ch stereo audio | • Surround Sound |
| Intel Easy Set-Up & Connect | • No remote control, no buttons on the adapter<br>• Setup & use only requires WPAN network connection<br>• Uses WFA WiFi Protected Setup | • Same |
| Intel My WiFi Optimized for Full HD 1080p Display | • It just works!<br>• Concurrent PAN-display & LAN-network access | • 5GHz WPAN improves robustness |
| Display Experience | •Acceptable latency for targeted key Living Room usages<br>• All Display Modes supported (Clone, Extended & Remote Only)<br>• Fast Cursor | • Lower latency for keyboard, mouse, and video <300ms |

## Progress

Q4 '10 WiDi v2.0
Full HD, 1080p, 5GHz Support, Huron River

## IMAGE VIEW ▶ Comparison of two

Watch the video through the TV.

### Video / music / photos (Contents Sharing)

▪ USB

▪ DLNA

### 2nd Monitor (Display Sharing)

▪ Intel Wireless Display

▪ Altona HDTV Wireless Adapter (UWB)

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**Wireless Display Similar technology**

**Wisair (www.wisair.com), Atlona (www.atlona.com) HDTV Solution**

**-Wireless 720p transmission via Wireless USB.**

**IOGEAR (www.aiogear.com)**

**- Wireless HD Video transmission via Wireless USB (1600 X 1200 or 1680 X 1050)**

**- Used within 10m.**

**G-Max (www.gmax.com)**

**-Wireless Full HD (1080p) transmission via Wireless USB.**

**AMIMON (www.amimon.com)**

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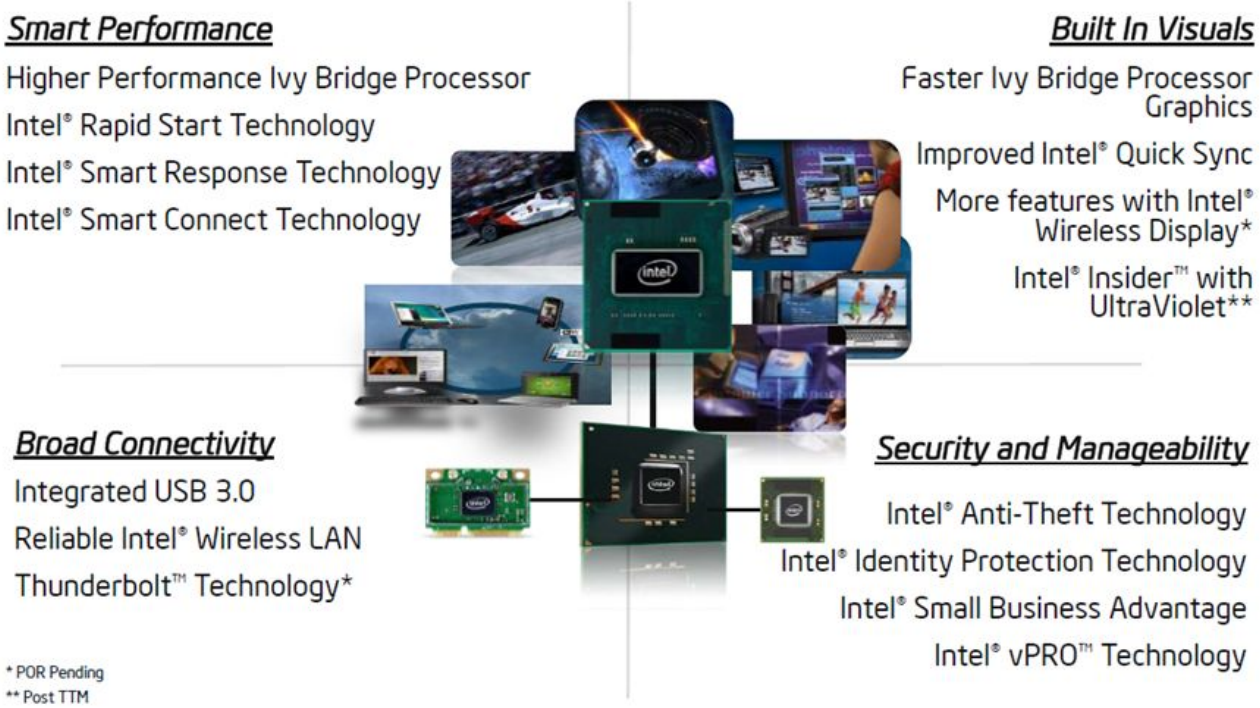
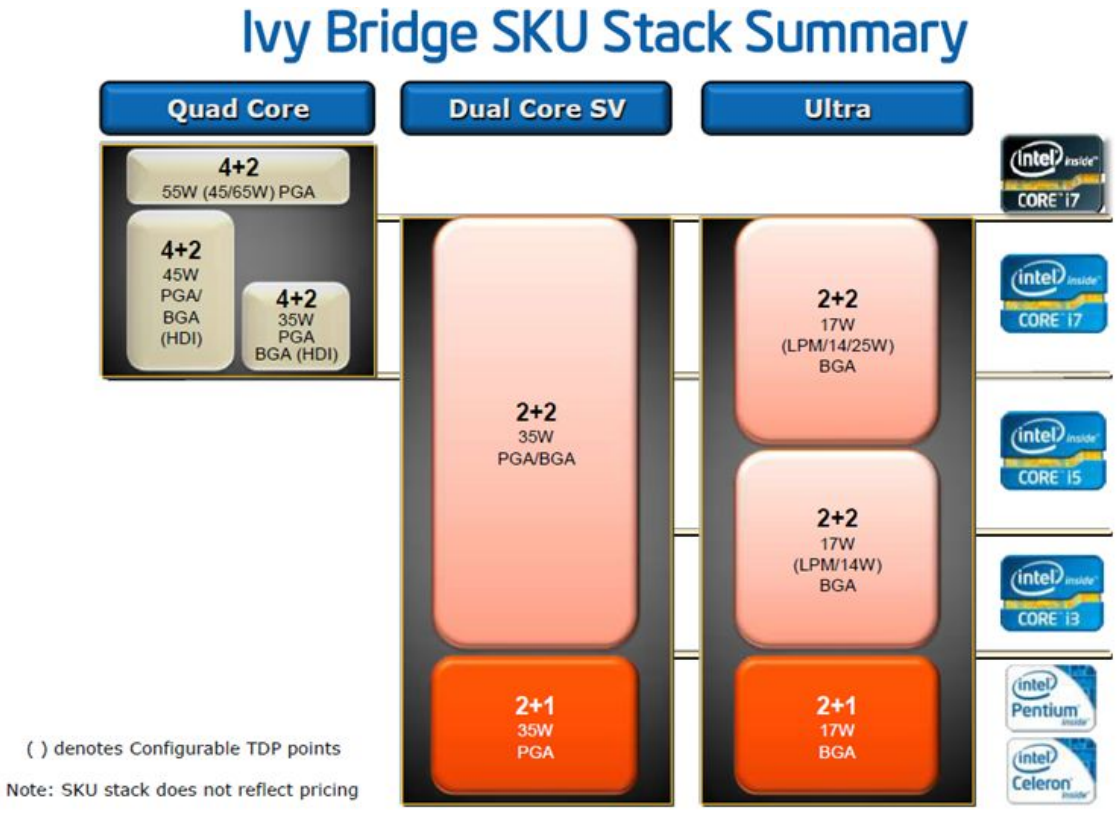
# 2.6. Hardware

## Intel's 2012 Mobile Platform : Chief River

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## Chief River Platform Features (Ivy Bridge vs. Sandy Bridge)

| | Ivy Bridge Processor on Chief River | Sandy Bridge Processor on Chief River |
|---|---|---|
| Brand | Intel® 3rd Generation Core Processor | Intel 2nd Generation Core Processor |
| Performance | Faster than SNB on CPU, Media, Graphics | Baseline |
| Thermals | 55W,45W, 35W, 17W, Configurable TDP[1,2], Low Power Mode[1] | 55W, 45W, 35W, 25W, 17W |
| Graphics | DX11**, PCIe 3.0, Switchable Graphics, In-Tru 3D™ | DX 10.1, Switchable Graphics, In-Tru 3D™, PCIe 2.0 |
| Media | Intel® Quick Sync Video, Intel® Insider™ with Ultraviolet*[1]; 3 independent displays[1] | Intel® Quick Sync Video, Intel® Insider™; 2 independent displays |
| I/O | USB 3.0[1], Thunderbolt™ Technology* | USB 3.0[1], Thunderbolt™ Technology* |
| Responsiveness | Intel® Rapid Start Technology[1], Intel® Smart Connect Technology[1], Intel® Smart Response Technology[1] | Intel® Rapid Start Technology[1], Intel® Smart Connect Technology[1], Intel® Smart Response Technology[1] |
| Wireless | Intel Wireless Display 3.0[1], Intel My WiFi Technology | Intel Wireless Display 3.0[1], Intel My WiFI Technology |
| Security | Identity Protection Technology[1], Anti-Theft Technology[1], SMEP[1], DRNG[1] | Identity Protection Technology[1], Anti-Theft Technology[1] |
| Enterprise/SMB | Intel vPRO™ Technology with AMT 8.0, Intel® Small Business Advantage | Intel® Small Business Advantage |

## Mobile Intel® 7 Series Chipset Family (Panther Point) Specification

| Feature | SFF[2] QS77 | Enhanced QM77 | Low Power UM77[4] | Storage HM77 | Base+ USB 3 HM76 | Base HM75 | Value HM70 |
|---|---|---|---|---|---|---|---|
| Application Segment | Corporate / Consumer | Corporate | Consumer / SMB | Consumer / SMB | Consumer | Consumer | Consumer |
| Support for Ultrabook™ | Best | Better | Best | Better | Good | N/A | No |
| TDP | 3.6W* | 4.1W | 3.0W | 4.1W | 4.1W | 4.1W | 4.1W |
| Average Power | 1.15W* | 1.22W | 0.84W | 1.22W | 1.22W | 1.22W | 1.22W |
| Package Size (XxYxZ) in mm | 22x22x1.488 | 25x25x1.788 | 25x25x1.788 | 25x25x1.788 | 25x25x1.788 | 25x25x1.788 | 225x25x1.788 |
| Corporate Manageability | Intel® vPro-Intel®, AMT 8.0[1] | | Not eligible for vPro™ | | | | |
| Intel® Small Business Advantage | Yes | Yes | Yes | Yes | No | No | No |
| Intel® Smart Response Technology and RAID | Yes[1,3] | Yes[1] | Yes[1] | Yes[1] | No | No | No |
| Total SATA Ports (6GB/s ports) | 6 (2) | 6 (2) | 4 (1) | 6 (2) | 6 (2) | 6 (2) | 4(1) |
| Total USB Ports (USB3 ports) | 14 (4) | 14 (4) | 10 (4) | 14 (4) | 12 (4) | 12 (0) | 8(2) |
| PCI Express I/O Ports | 8 | 8 | 4 | 8 | 8 | 8 | 4 |
| VGA | Yes | Yes | No | Yes | Yes | Yes | Yes |
| LVDS | Yes | Yes | No | Yes | Yes | Yes | Yes |
| POR FIRMWARE | 5MB/1.5MB | 5MB | 5M/1.5MB | 5M/1.5MB | 1.5MB | 1.5MB | 1.5MB |

* If the VGA port is not used on QS77, and the laptop uses an eDP panel, then QS77 can achieve about the same low power as UM77


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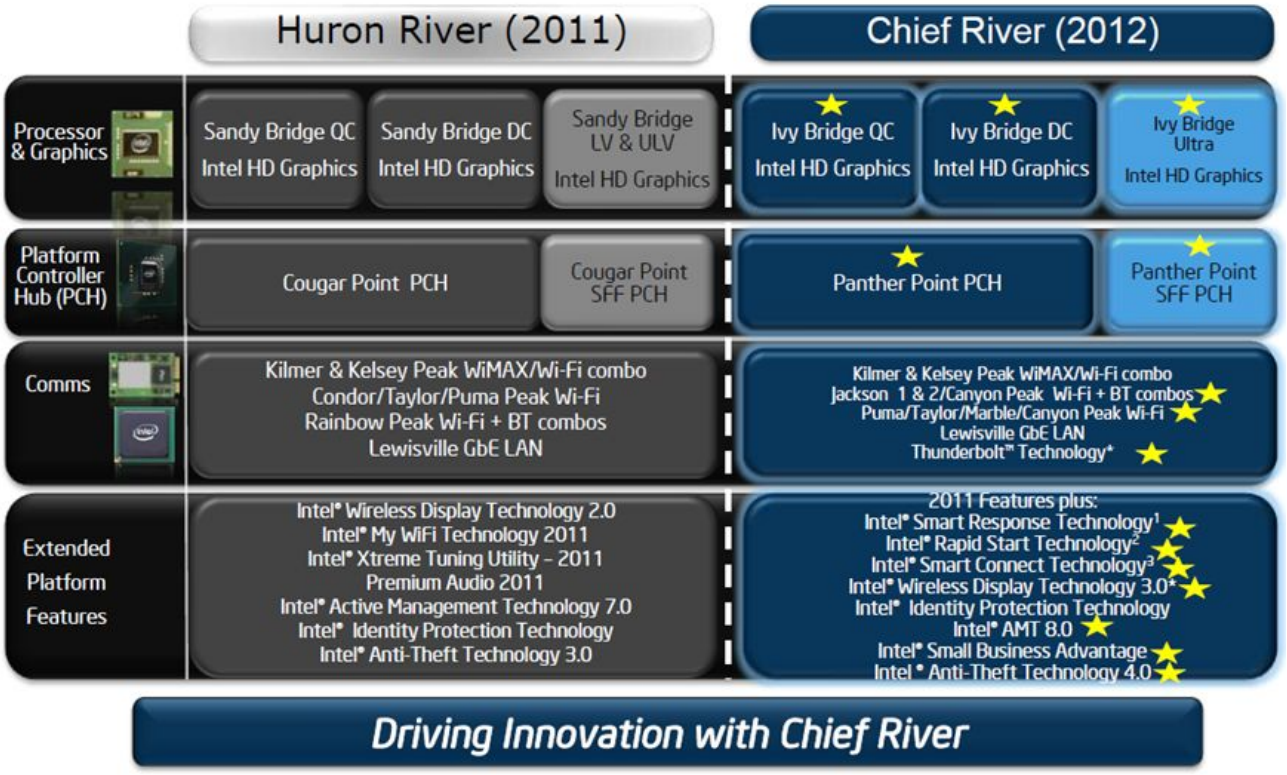


## Intel® Wireless Display Value Proposition

# Intel® Wireless Display 3.0

- **What is Intel® Wireless Display 3.0 (Wi-Di) and How Does it Work?**
  - Wirelessly Connect Your Laptop to Your TV and Enjoy Media in Comfort
- ***3.0 adds:*** NEW
  - Stereoscopic 3D
  - Lower Latency between PC and TV
- **What are the Usages and/or Value Propositions?**
  - Share videos/pictures
  - Theatre experience with content from notebook

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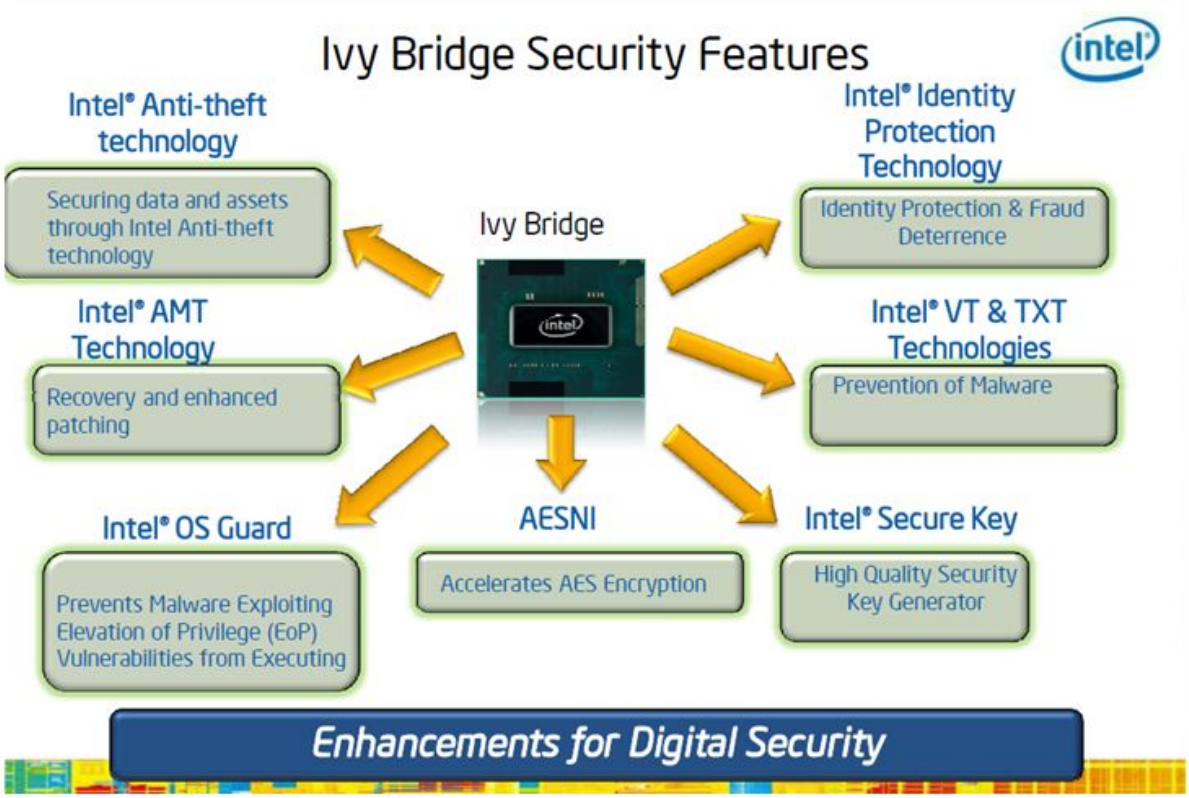
## Intel® Security Features




## Intel® Security Features

- **What is Intel® Identity Protection Technology 2012 (ITP) and How Does it Work?**
  - Intel's ITP implements the One Time Password (OTP) Identity Protection standard used in the industry today
  - Allows ISV's to embed OTP Token generators into the Intel® ME firmware
  - Used as a second factor of authentication on top of user name & password

- **What is Intel® Anti-Theft Technology 4.0 (AT) and How Does it Work?**
  - Intel® AT provides built-in capabilities to connect to a stolen or lost platform and automatically disable the system
    - Can disable the PC to prevent use when lost or stolen
    - Can still manage PCs even when HDD is encrypted or OS is contaminated
  - ***Intel® AT 4.0 adds 3G WWAN "kill pill"*** NEW
    - OOB communication between ME and 3G NIC (via SMBUS)
    - 3G NIC receives "kill pill" when powered and sends to Intel® ME Anti-Theft Service

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# 3nd Generation Intel® Core™ Processor Graphics

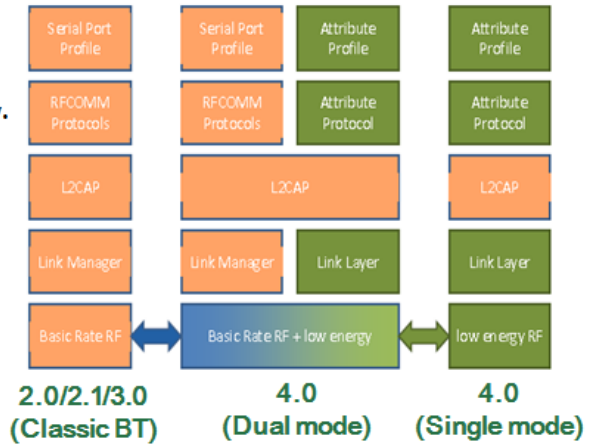
## Ivy Bridge Graphics Highlights

- Continuing with 2 SKU graphics strategy
  - 6 EU (GT1) or 16 EU (GT2)
- Support for up to 3 Simultaneous Displays
- 30% 3D enhancements for improved gaming**
  - DX11* and OpenGL3.1* support
- Faster Media Performance enhancements from Sandy Bridge**
  - Detail feature lists will be updated later

**BT 4.0**

- PC Side: BLE Device in connection with the existing BT 3.0 features were added.
- Device Side: This model is applied not only BT 3.0 but also BLE(Bluetooth Low Energy) only.
- Device characteristics of BLE only
- The controller is implemented as a simple structure. Chip/Device(Affordable price)
  - Low power consumption. The device's battery life increased dramatically.
    (For example) A number of Coin Cell can use the BT Keyboard with BLE Technology more than a year months)
  - The device with BLE only is not compatible with Classic Bluetooth(BT 3.0)

- Single Mode
  - BLE supports only
  - Simple structure, Affordable price, It is easy to apply.
  - Peripheral device is used.
  - Ex) BT KBD, MOUSE, Heart Rate Monitor
- Dual Mode
  - Classic BT and simultaneous support BLE.
  - HOST device uses
  - Ex) PC, Phone

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# WLAN

## ❑ Intel Jackson peak BT 4.0 Wlan module

Network Standards : Jackson Peak2.0 + BT4.0 combo

Form factor: Mini Card haft size

Chipset: WLAN Advanced-N 6235

TOP

Bottom

**BA59-03294A Vendor---Intel**

# SSD

**•Density**
–

**•Form Factor**
- Mini PCIe type
- (29.85 ± 0.15 x 50.80 ± 0.15 x 3.75 ± 0.05)mm

**•Host interface**
– Serial ATA interface of 3.0Gbps
– Fully complies with ATA/ATAPI-7 Standard (Partially Complies with ATA/ATAPI-8)
– Power Saving Modes: HIPM, DIPM (Partial / Slumber mode)
– Support NCQ : Up to 32 depth
– Synchronous Signal Recovery

**•Performance**
- Host transfer rate: 300 MB/s
- Sequential Read : Up to 220 MB/s (128/64/32 GB)
- Sequential Write : Up to 200 MB/s (128GB)
  Up to 180 MB/s (64GB)
  Up to 90 MB/s (32GB)

* Actual performance may vary depending on use conditions and environment

**•Power Consumption**
– Active* : 50mA / 0.165W
– Idle** : 43mA / 0.142W
* Active power is measured during execution of Mobilemark 2007 in Windows7
** DIPM enabled value

**•Temperature**
– Operating : 0°C to 70°C

**•Shock**
– Shock : 1500G, duration 0.5ms, Half Sine Wave
– Vibration : 7~800Hz, 3.08Grms, 30min/axis(X,Y,Z)

* Applicable only for cased product

**•MTBF**
– 1,500,000 Hours

**•Weight**
– 128GB : Max 9g
– 64GB : Max 9g
– 32GB : Max 9g

**SSD Connector Type**

| | mSATA |
|---|---|
| I/F | SATA2 3.0Gbps |
| Connector | 52pin minicard |


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# 2.7. Software

## Driver LIST

| | Item Name |
|---|---|
| **Driver** | Chipset (Chief River ) |
| | Realtek ALC26X Windows7 Sound Driver |
| | Intel Ivybridge Win7 32bit GFX Driver |
| | Intel Ivybridge Win7 64bit GFX Driver |
| | Windows7-Realtek LAN Driver[Gigabit] |
| | NEC (Renesas) USB 3.0 Host Controller Driver |
| | Intel Rapid Storage Technology |
| | Realtek ALC26X Windows7 Sound Driver |
| | Intel WLAN Driver with myWiFi (s32)(14.2.1.1 WIFI) |
| | Intel Bluetooth Driver (Win7)(2.1_PSTOBE) |
| | Heci(Chief River,SWDESC)_Package |
| | Infineon TPM Utility |
| | Touchpad- Elan (ETD0B00)(1.0) |
| **Application** | Easy Settings 1.1 |
| | Easy Settings 1.1 for Amor2/Lotus Fast Boot |
| | KBD Launguage Exchanger (ENG/RUS) |
| | sogou (with ENG/CHN KBD exchanger) |
| | Easy Migration 1.0 |
| | Software Launcher 1.1 |
| | Fast Browsing for IE9 |
| | Samsung Theme (Premium) |
| | Design Movie cliip |
| | AnyWeb |
| | Universal Printer/Sacnner Driver |
| | Easy Partition Manager 2.2 |
| | Electronic Manual |
| | Interactive guide |
| | EPOP |
| | MultiMedia POP |
| | Survey Icon |
| | Easy File Share 1.2 |
| | Smartview 1.0 |
| | Allshare 2.1 |
| | Easy Support Center 1.2 |
| | Easy Software Manager 1.2 |
| | Samsung Recovery Solution 5.0 |
| | Samsung Internet Service Short cut |

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| | |
|---|---|
| | Samsung.com short cut |
| | Windows Live 4 QFE2 |
| | MS Bing Toolbar 7.0 |
| | MSN Homepage |
| | WildTangent Game Console |
| | Norton Internet Security 2012 (EXP: 60 days Trial, KOR : 1Year Trial) |
| | Norton Online Backup (30-day Trial) |
| | Skype |
| | Kindle for PC |
| | Adobe Reader 10 (MUI) |
| | Cyberlink Youcam 3.1 |
| | Intel Wireless Display |
| | Absolute Data Protection |
| | Infineon TPM Professional Package |

## Software-Previous/New

**※ For more information, product descriptions and installation training manuals refer to Chap.1**

## Consultation stage of development

※ Consultation of development stage. (Known Issue & Spec)

Please refer that [Consulting Script] → [Consultation]


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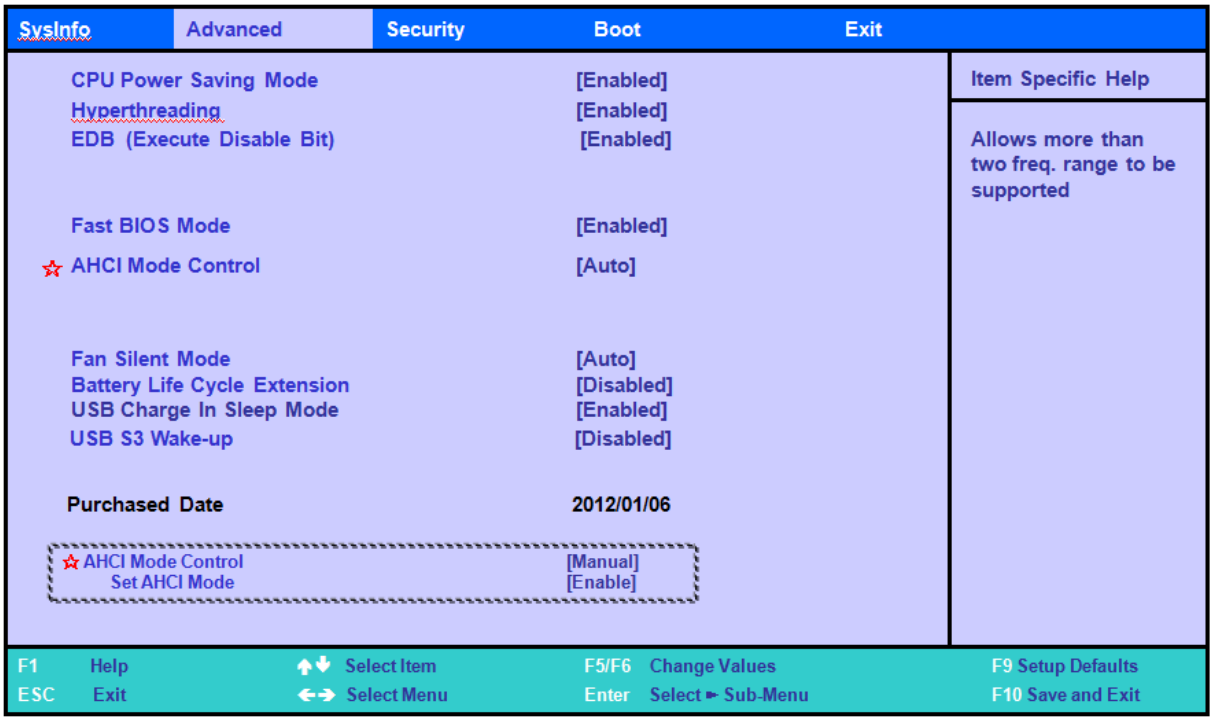
# 2.8. Bios Setup

- SATA Port 1
  => HDD model name is displayed in this item for SATA Port 1.
- Total Memory
  => Total memory size of the system..
- Slot1 Memory
  => Memory size of the slot 1
- Slot2 Memory
  => Memory size of the slot 2.

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- **CPU Power Saving Mode**
  => 'Enabled' will decrease system power consumption.
- **Hyperthreading**
  => This selects whether Intel® CPU performance will improve.
- **EDB (Execute Disable Bit)**
  => supports the Data Execution Prevention (DEP) feature. DEP is a set of H/W & S/W technologies that perform additional checks on memory to help prevent malicious code from running on a system.
- **Fast BIOS Mode**
  ◆ Fast BIOS Mode란?
  부팅 시간을 빠르게 하기 위한 기술로, POST에서 USB 값을 체크하지 않아 부팅 시간을 단축하는 기술입니다.
  → 단, 도스 모드 부팅 안 됨 (기본장착 ODD 및 USB 메모리 등)
  ※ 기본 장착된 ODD 및 USB 디바이스 (CDROM 및 메모리 등)로 부팅되지 않을 경우
  CMOS SETUP 內, Fast Bios Mode 항목을 Disable로 변경하세요.
  ◆ 증 상
  - 기본장착 ODD 및 USB 장치(CDROM 및 메모리등) 로 부팅 안됨
  - 신규 HDD(MBR이 깨끗한 A급 HDD) 장착후 부팅 시, POST에서 무한 재부팅됨
  ◆ 원 인
  - 부팅 시 USB 값을 읽지 않고 좀 더 빠르게 부팅하기 위한 조치사항
  ◆ 대 책
  - CMOS SETUP 매뉴에서 [Fast BIOS Mode] 항목을 Disable 로 변경 시, 해결됨
  ※ 제품 구매 시, 기본 설정은 [Disable] 이며, Purchase Date 등록 되는 시점에 자동으로 [Enable]로 변경됨
- **AHCI Mode Control**
  => Select AHCI Mode option.
  => Select [Auto] : In accordance Master, AHCI mode changed automatically AHCI/IDE.
  => Select [Manual] : AHCI Mode changed by user to AHCI/IDE Mode.
  => Samsung produce Default AHCI enabled Master.
- **Fan Silent Mode**
  => [Low], the system temperature according to the fan On / Off repeatedly to adjust the RPM Off the temperature even lower, only by setting On / Off is set to minimize the noise between. For non-auto and the same.
  => When you select [Auto], Fan of the rotation and stop operation Should be repeated.
- **USB Charge In Sleep Mode**
  => 'Enabled' means that the system supports the USB charge feature at the port which has the special icon in sleep mode
- **Battery Life Cycle Extension**
  'Enabled' means that the system will charge the battery up to 80% for extending the battery life cycle.
- **USB S3 Wake-up**
  => Select Enabled to support that system can be waked up from ACPI S3 state by USB activities.
- **Purchased Date**
  => Purchased date is displayed after 10 times boot.

# Bios Setup-System memory share

<table>
<tr><th></th><th>XP<br>(DVMT graphics memory allocation controlled by the driver: Intel)</th><th colspan="2">VISTA/WIN7<br>(OS controls the allocation of graphics memory: inter, AMD)</th></tr>
<tr><td>INTEL<br>(INT VGA)</td><td>Fixed (BIOS) + DVMT (control type).<br>Graphics set in the BIOS settings+DVMT<br>(Auto,64MB,128MB,256MB,512BM,MAX)</td><td>Fixed(BIOS) + DVMT(os control)way<br>(default 64MB~system memory capacity standard)<br>*64MB : BIOS settings to default</td><td><table><tr><th>default secure graphics memory</th><th>64MB</th></tr><tr><td>1GB System Memory</td><td>64MB ~ 384MB</td></tr><tr><td>2GB System Memory</td><td>64MB ~ 896MB</td></tr><tr><td>3GB System Memory</td><td>64MB ~ 1401MB</td></tr><tr><td>4GB System Memory</td><td>64MB ~ 1919MB</td></tr><tr><td colspan="2">•OS by calculation (default 64MB ~ system memory capacity standard) OS automatically adjust<br>•Basic Error may occure</td></tr></table></td></tr>
<tr><td>AMD(INT VGA)</td><td>Fixed (BIOS) Type<br>Graphics memory, only configuration values assigned, Set in the BIOS<br>(Auto,64MB,128MB,256MB,512BM,MAX)</td><td>Fixed(BIOS) + DVMT(os control)way<br>(default 256MB~system memory capacity standard)<br>*256MB : BIOS settings to default</td><td><table><tr><th>default secure graphics memory</th><th>256MB</th></tr><tr><td>1GB System Memory</td><td>256MB ~ 384MB</td></tr><tr><td>2GB System Memory</td><td>256MB ~ 896MB</td></tr><tr><td>3GB System Memory</td><td>256MB ~ 1401MB</td></tr><tr><td>4GB System Memory</td><td>256MB ~ 1919MB</td></tr><tr><td colspan="2">•OS by calculation (default 256MB ~ system memory capacity standard) OS automatically adjust<br>•Basic Error may occure</td></tr></table></td></tr>
<tr><td>NVIDIA<br>(EXT VGA)</td><td>Only external graphics</td><td>Only external graphics</td><td></td></tr>
</table>


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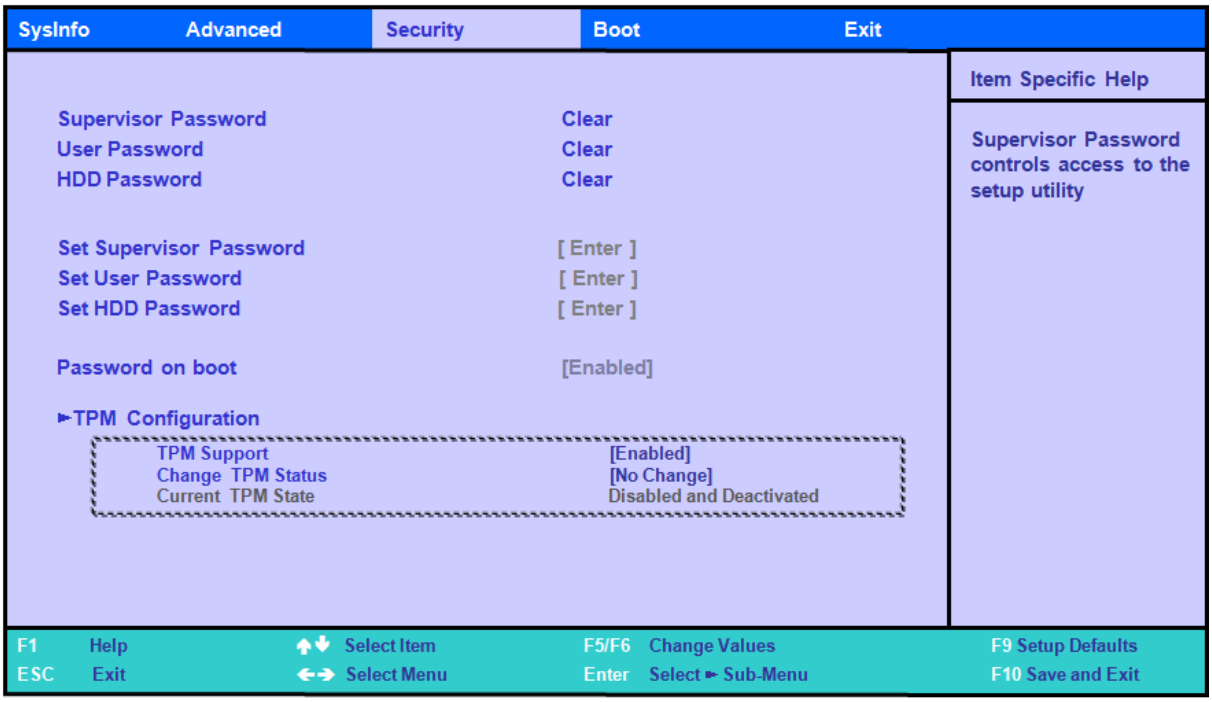
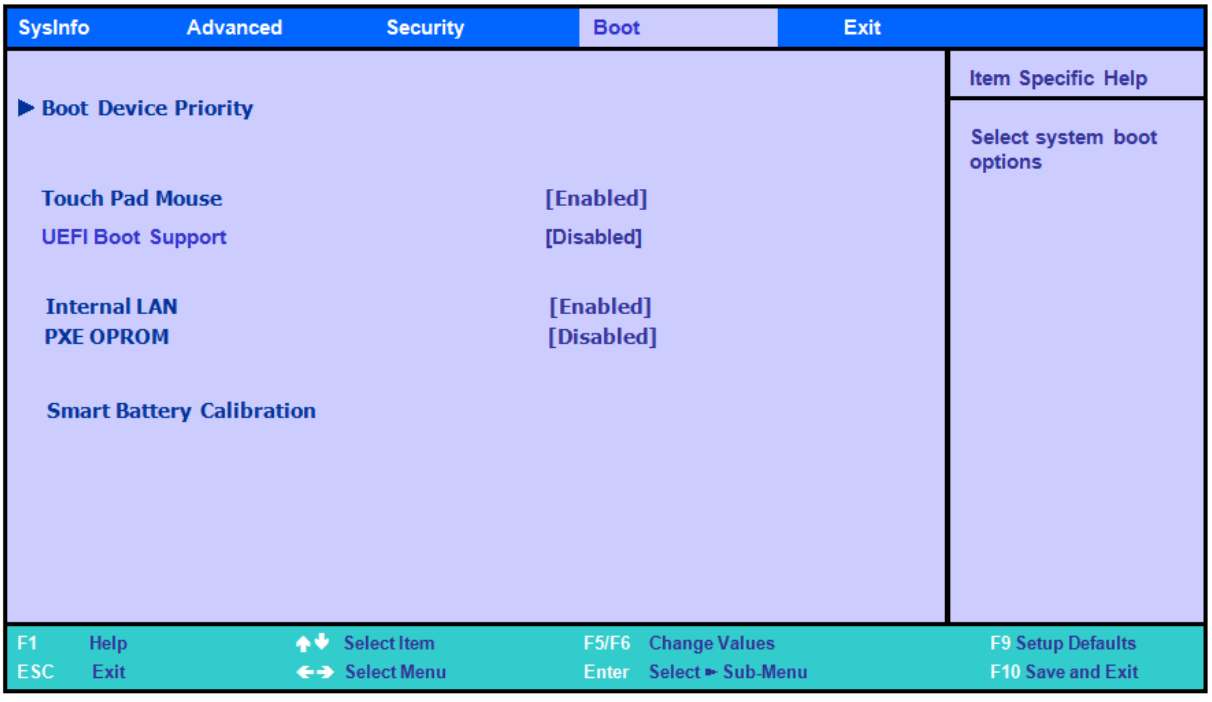



- Set the Supervisor Password
  => Supervisor Password controls access to the setup utility.
- Set a User Password
  => User Password controls access to the system at boot
- Set a HDD Password
  => After saving the setting, the system must be powered OFF and ON for the password to be set as Enabled or Disabled
- Password on Boot
  => Password On Boot
- TPM Support
  => This is used to decide whether TPM support should be enabled or disabled
- Change TPM Status
  => Enact TPM Action.
  Note: Most TPM actions require TPM to be enabled to take effect.

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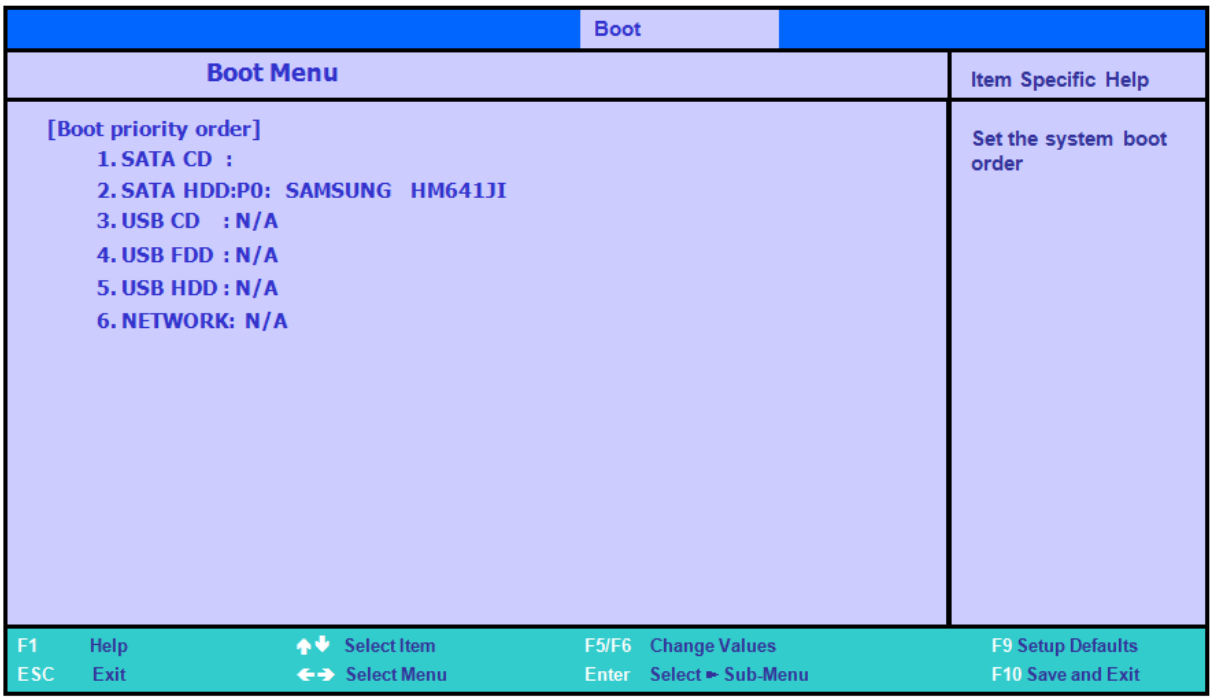


- **Boot Device Priority**
  => Select system boot options.
- **Touch Pad Mouse**
  => 'Disabled' prevents installed Touch Pad mouse from functioning, but frees up IRQ 12.
  => 'Enabled' forces the Touch Pad mouse to be enabled.
- **Internal LAN**
  => Setting item to "Enabled" will allow the internal LAN to operate correctly.
  Setting item to "Disabled" will remove the internal LAN from PCI Config space.
- **PXE OPROM**
  => 'Enabled' means that PXE network boot function is loaded, so the user can make the system PXE boot by changing Boot Device Priority.
  => 'Disabled' means that the system doesn't support PXE network boot function.
- **UEFI Boot Support**
  => Enabled means that the system can boot Legacy PS or UEFI OS.
  Disabled means that the system can boot Legacy OS only.


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- Exit Saving changes
  => Reset the system after saving the changes.
- Exit Discarding Changes
  => Reset the system setup without saving any changes.
- Load Setup Defaults
  => Load Default setting.
- Discard Changes
  => Discard Changes made so far to any of the setup options.
- Save Changes
  => Save Changes made so far to any of the setup options.

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# 2.9. HW & Option Materials

### Basic Item

**Contents** / Table des matières / Inhalt / Contenido / Sommario

**Computer**
Ordinateur
Computer
Ordenador(computador)
Computer

**AC Adapter**
Adaptateur CA
Wechselstromadapter
Adaptador CA/CC (Fuente de alimentación)
Adattatore CA

**Power Cable**
Cordon d'alimentation
Netzkabel
Cable de alimentación
Cavo di alimentazione

**LAN Adapter**
Adaptateur LAN
LAN-Adapter
Adaptador LAN
Adattatore LAN

| | image | Item | Code | Quantity | Ver |
|---|---|---|---|---|---|
| ACCESSORIES | | Adapter 40W (3.0Pie)<br>Power Cable | BA44-00272A | 1 | 1.0 |
| | | Quick Guide | BA99-20221A | 1 | 1.0 |
| | | LAN Adapter | BA39-01204A | 1 | 1.0 |


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## Option Materials

**Optional part** (sold separately) / Accessoires (en option) / Zubehör (optional) / Accesorios (opcional) / Accessori (opzionali)

**VGA Adapter**
Adaptateur VGA
VGA-Adapter
Adaptador VGA
Adattatore VGA

**Wireless Mouse**
Adaptateur VGA (en option)
VGA-VGA (Optional)
Adaptador VGA (opcional)
Adattatore VGA (opzionale)

**Pouch**
Etui
Tasche
Bolsa
Custodia

※ mouse is currently being developed. Code and description will be updated later.

| | image | item | code | Quantity | Ver |
|---|---|---|---|---|---|
| ACCESSORY | | Wireless mouse | TBD | 1 | 1.0 |
| | | External ODD | AA-ES3P96M | 1 | 1.0 |
| | | VGA adapter | BA39-01203A | 1 | 1.0 |
| | | Pouch | BA69-01187A | 1 | 1.0 |

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## Wireless Mouse

## VGA & LAN Adapter

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## *Optional component(SSD)

**NT900X4D has the following optional components to add or replace.**
**The type of component can be added later.**

| | | | |
|---|---|---|---|
| SSD | 128GB,MZMPC128HBFU-000KN,S63,H16,D16385,3.75mm,mSATA,SATA,MLC SSD,SATA3 | BA59-03340A | SEC |
| SSD | 256GB,MZMPC256HBGJ-000KN,S63,H16,D16385,3.75mm,mSATA,SATA,MLC SSD,SATA3 | BA59-03339A | SEC |

| | | | |
|---|---|---|---|
| SSD | 128GB,SDSA5DK-128G-1004,S63,H16,D16385,3.2mm,30*51mm,SATA,mSATA, MLC | BA59-03232A | Sandisk |
| SSD | 256GB,SDSA5DK-256G-1004,S63,H16,D16385,3.2mm,30*51mm,SATA,mSATA, MLC | BA59-03233A | Sandisk |

## *Optional component(Memory)

**NT900X4D Memory can be upgraded to max. 8GB by using 2GB, 4GB memory.**
(Notice: Contact with service man)

| | | | |
|---|---|---|---|
| 2GB MEMORY | M471B5773CHS-CH9,DDR3 2G SODIMM,2GByte,256Mx64bits,SODIMM,204P,67.6x30.00mm,-,1.5V,+-0.075V,0to95C,280mA,TR | 1105-002217 | SEC |
| 2GB MEMORY | M471B5773DH0-CH9,DDR3 2G SODIMM,2GByte,256Mx64bits,SODIMM,204P,67.6x30mm,8ns,1.5V,+-0.075V,0to+95C,280mA,TR | 1105-002224 | SEC |
| 4GB MEMORY | M471B5273DH0-CH9,DDR3 4G SODIMM,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,8ns,1.5V,+-0.075V,0to+95C,320mA,TR | 1105-002209 | SEC |
| 4GB MEMORY | M471B5273CH0-CH9,DDR3 4G SODIMM,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,8ns,1.5V,+-0.075V,0to+95C,320mA,TR | 1105-002211 | SEC |
| 4GB MEMORY | M471B5273CM0-CH9,DDR3 4G 1333MHz,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,255ps,1.5V,+-0.075V,0to+95C,1120mA,TR | 1105-002294 | SEC |
| 2GB MEMORY (1600MHz) | M471B5773DH0-CK0,DDR3 2G 1600MHz,2GByte,256Mx64bits,SODIMM,204P,67.6x30mm,225ps,1.425V~1.575V,+-0.075V,0to+95C,160mA,TR | 1105-002328 | SEC |
| 4GB MEMORY (1600MHz) | M471B5273DH0-CK0,DDR3 4G 1600MHz,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,225ps,1.425V~1.575V,+-0.075V,0to+95C,320mA,TR | 1105-002327 | SEC |

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# 3. Desassembly and Reassembly

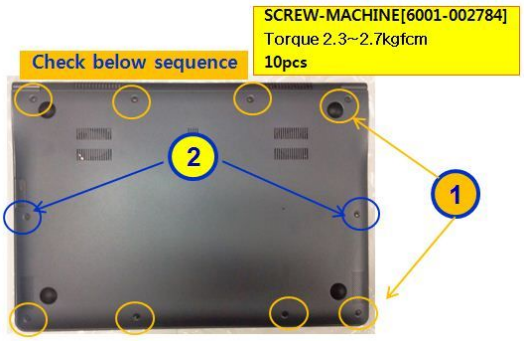
## 3.1. Main System

**CAUTION**

**Turn off the system before disassembly.**

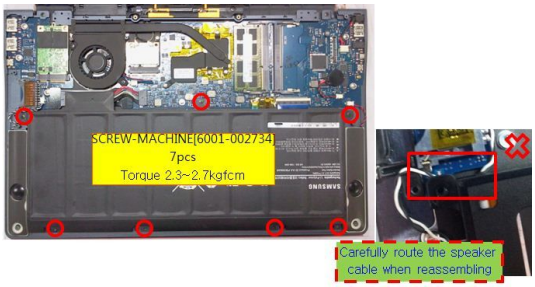
**1.** Disassemble Bottom

Loosen 10 screws in order of (8ea) -> (2ea) to separate the system bottom.




**2.** Disassemble Battery

Remove 7 screws to separate Battery from the system.

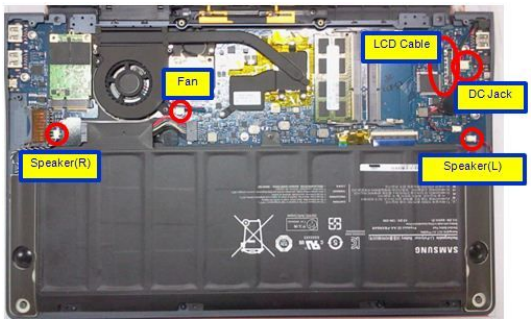



**3.** Battery connector

Pull the battery connector to remove battery.

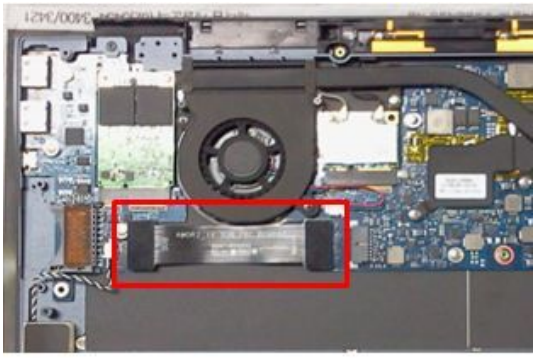
**4.** Disconnect Speaker/Fan/DC Jack/ LCD Cable

Disconnect cables in the areas circled




**5.** Remove Subboard FPC

Carefully remove subboard FPC not to damage the connector. Also, carefully detach double-sided tape on the bottom side of the FPC.

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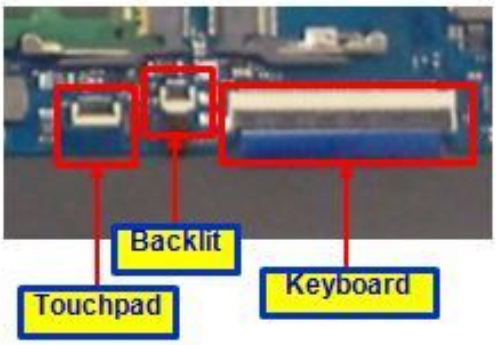
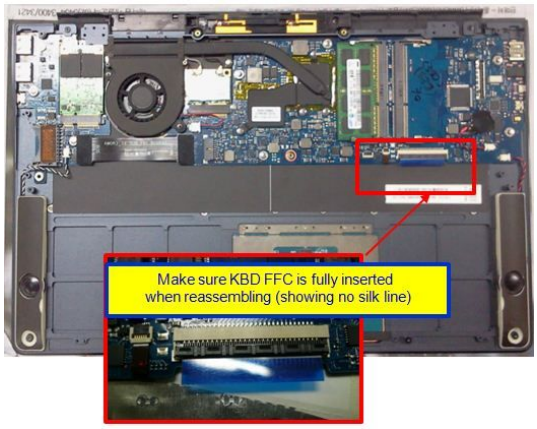
**6.** Disconnect Keyboard, KBD backlit, Touchpad

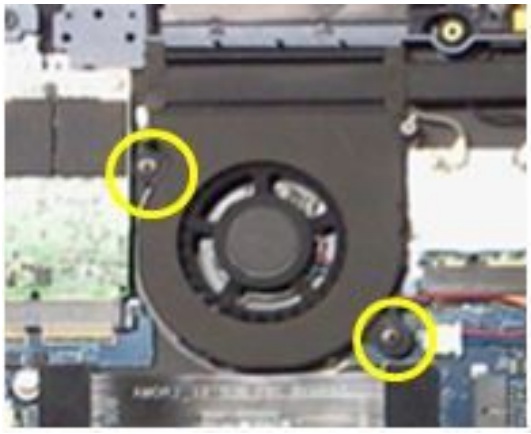
From right to left: Keyboard, KBD backlit, T/P



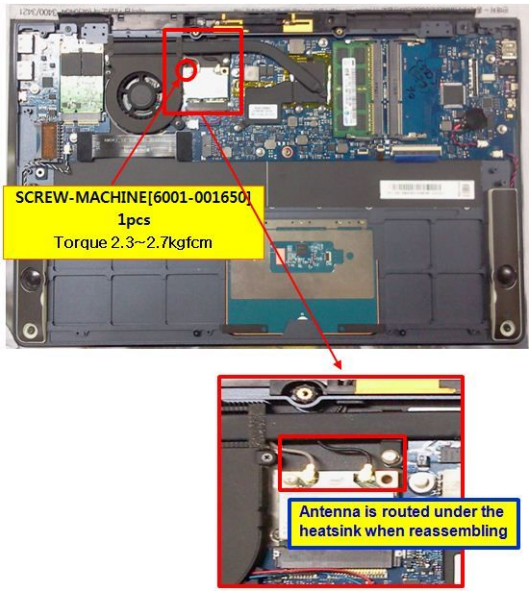




**7.** Remove Fan

Remove two screws to detach the fan



**8.** Unplug antenna and unscrew wireless LAN module




**9.** Remove Main/Sub board by unscrewing screws in red circle.

SSD – 1 screw / Subboard – 3 screws / Mainboard – 5 screws

※ Caution: When reassembling the subboard, make sure the board is fixed under the rib circled in red.

: Power switch/power LED may be damaged if assembled on the rib.

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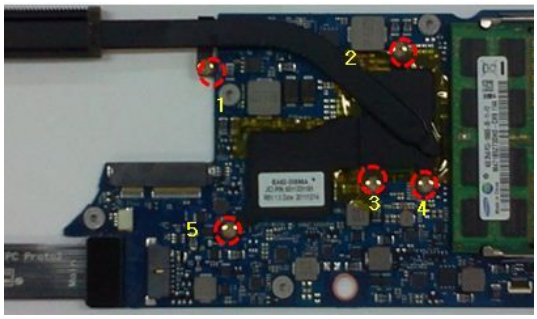
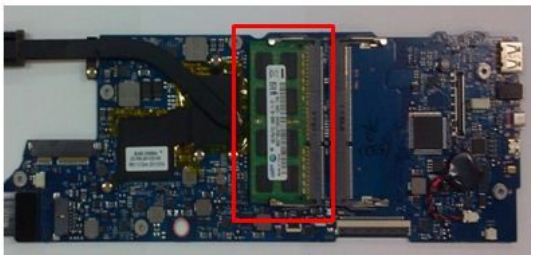
**10.** Heatsink disassembly

Remove 5 screws to disassemble heatsink.



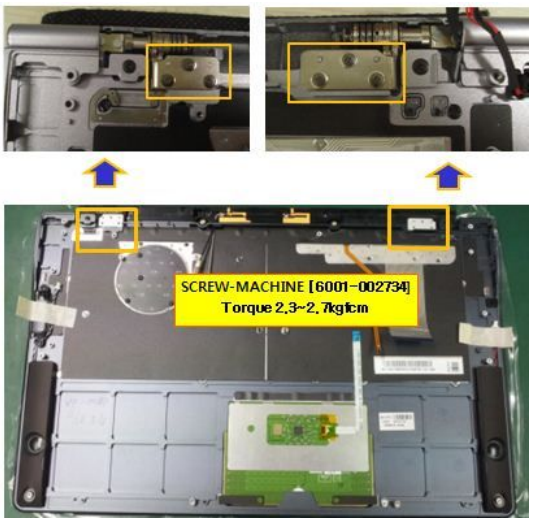

**11.** Removing memory module

Pull two hooks on the side to remove memory module.



**12.** Separate Hinge

When changing LCD Ass'y, remove 6 screws on the hinge to separate the LCD and top.




**※ Refer to this section backwards for resassembly**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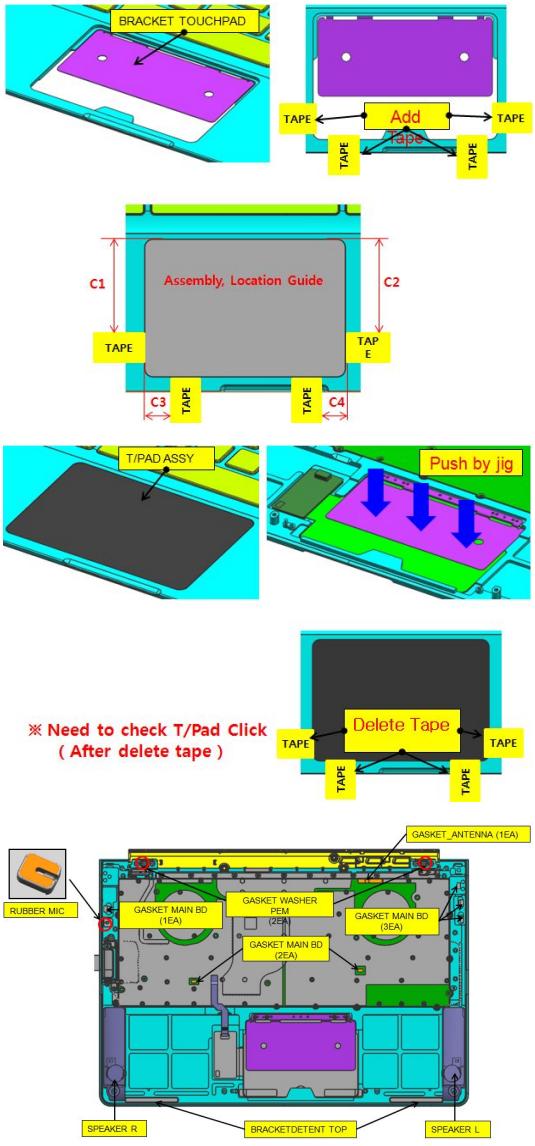
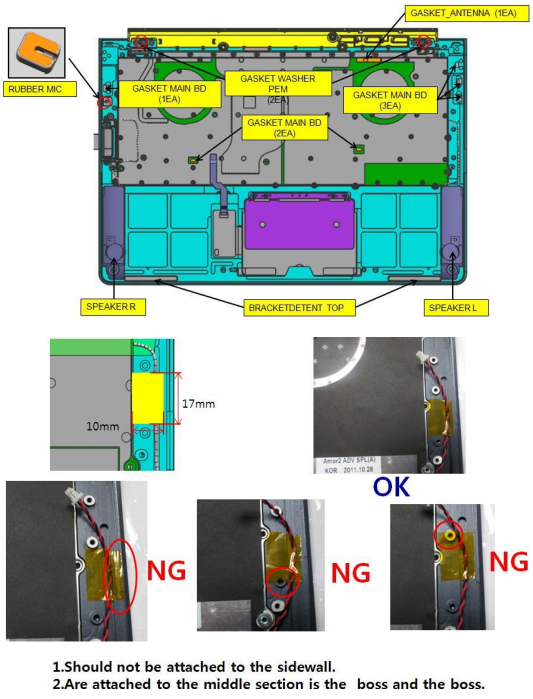
# 3.2. TOP A'ssy

**1.** TOUCHPAD Assembly

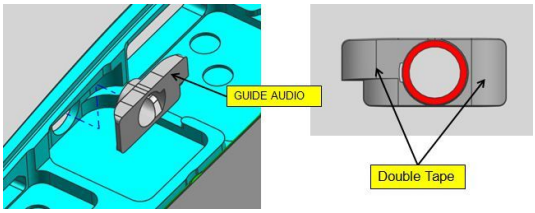



**2.** SUB PART Assembly

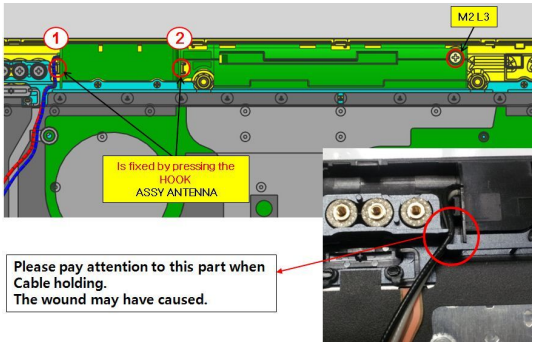



1.Should not be attached to the sidewall.
2.Are attached to the middle section is the boss and the boss.

**3.** AUDIO GUIDE Assembly




**4.** ANTENNA Assembly




Please pay attention to this part when Cable holding.
The wound may have caused.

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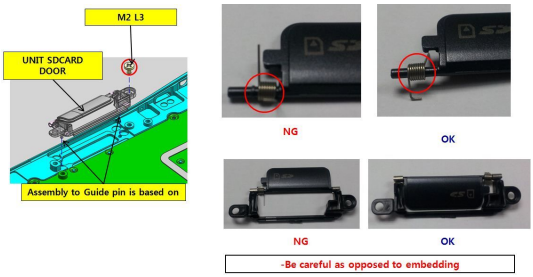
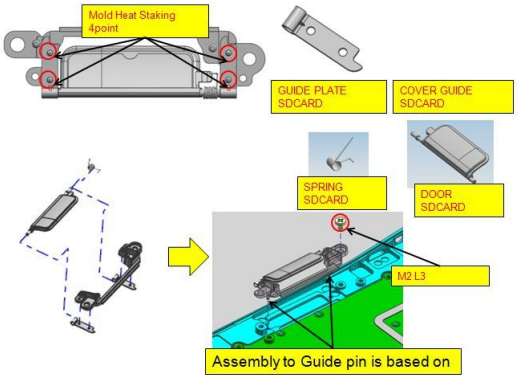
**5.** 3 in 1 Assembly




**Caution should be warpage.**
**(spec +0 -0)**

NG

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# 3.3. LCD A'ssy

**CAUTION**

**※ LCD is assembled as a whole unit. Cannot disassemble.**

**- LCD panel of the open cell structure. So will not be reused.**

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# 4. Trouble shooting

## 4.1. General spec

### Tools used for repairing the product.

- System Diagnostics Disk
- MS-DOS Booting Disk
- System Diagnostics Card
- Screwdrivers (+, —)
- Tweezers
- Multi-meter
- Oscilloscope / Logic Analyzer

### Replace Units (FRU: Field Replaceable Unit)

- DDR3 RAM Module
- 2.5" SATA HDD
- Wlan module / Bluetooth Module
- System Fan
- LCD Panel
- Main Board
- System Fan
- Key Board
- Touch Pad
- Modem
- 0.3M Camera module
- Cables
- LCD Panel / LCD Inverter


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# 4.2. Debugging Flow Chart

Debugging Flow of Samsung's computer product is universal between products.

Refer to attached Debugging Flowchart for more contents.

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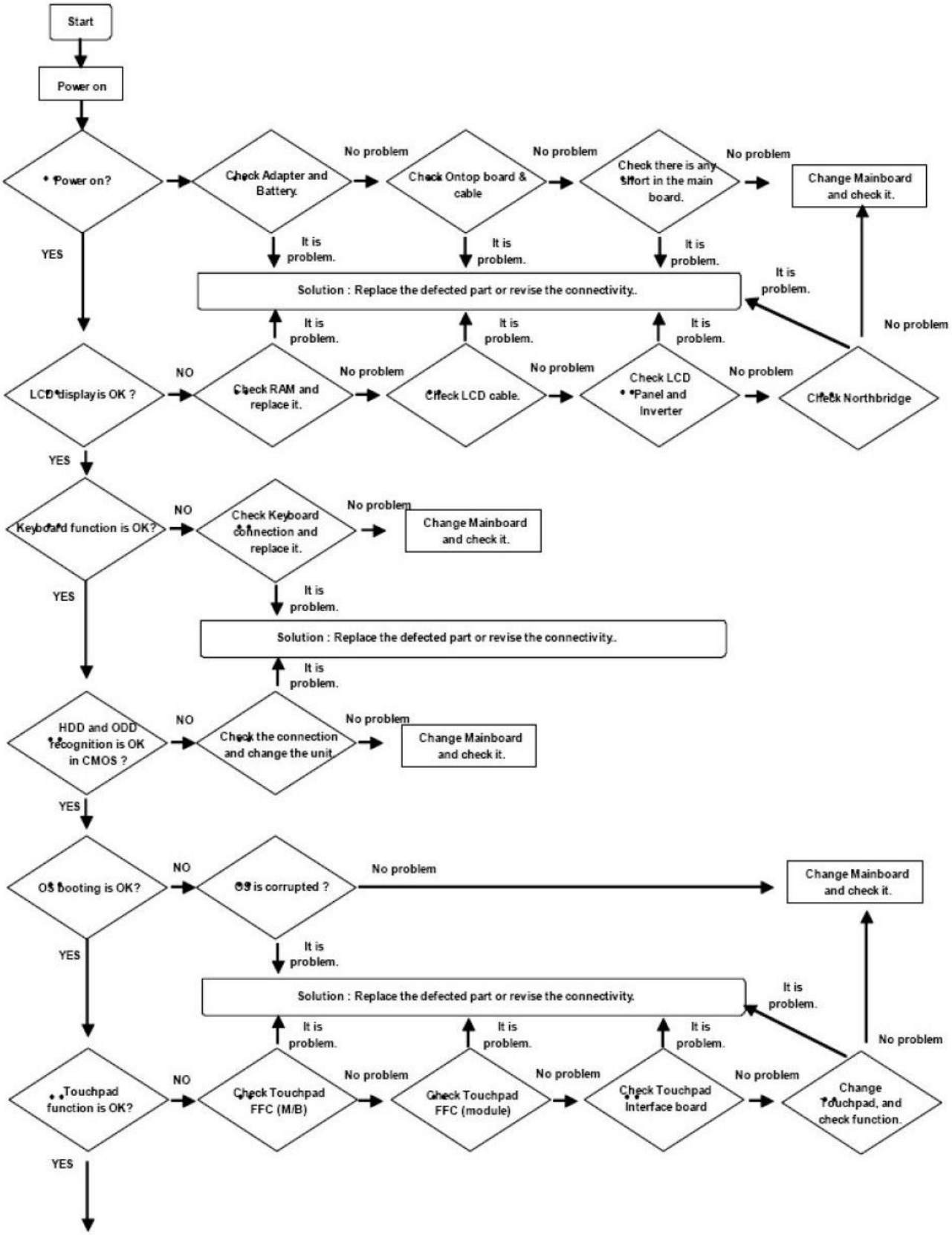



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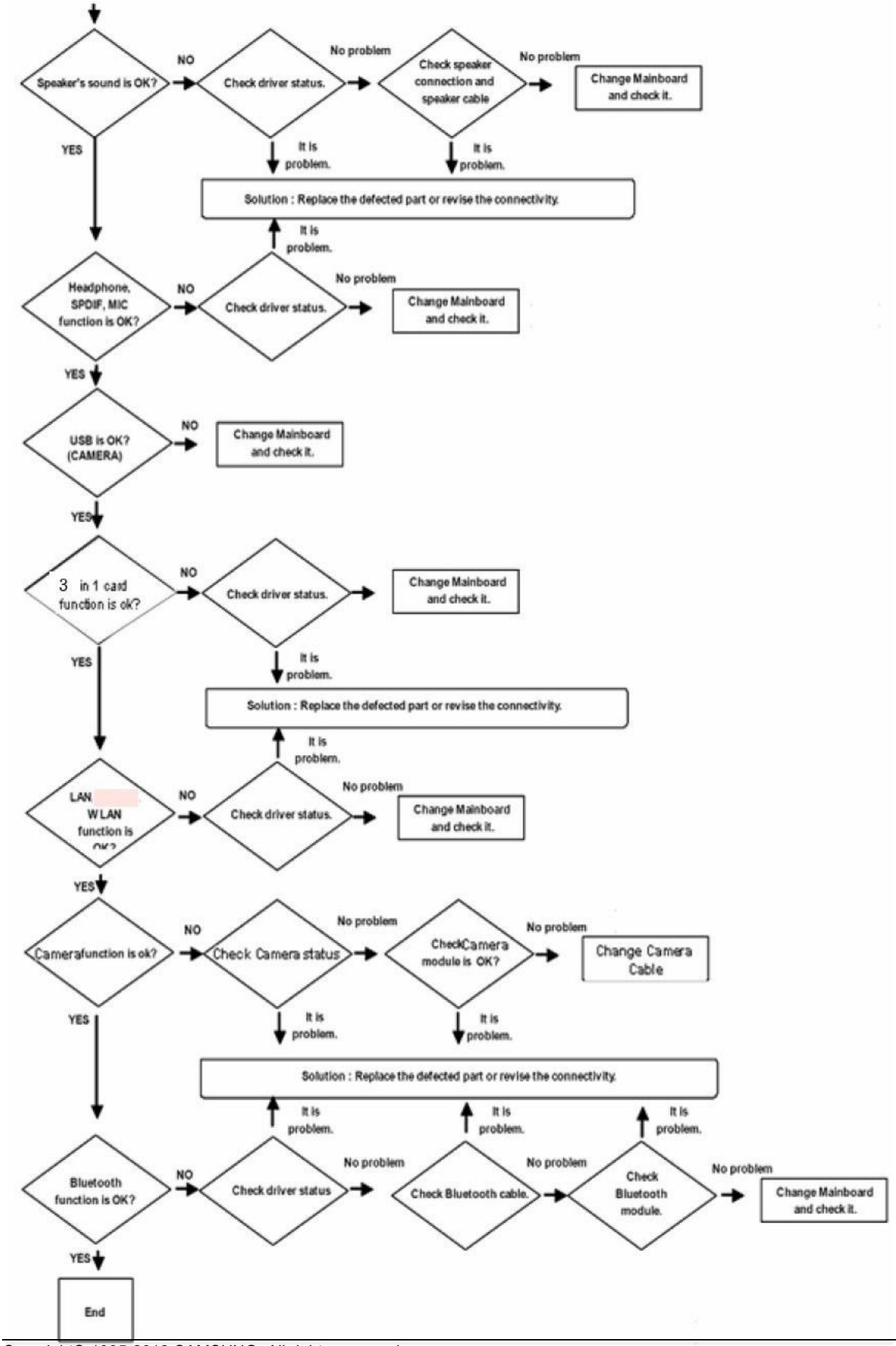


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# 4.3. Diagnosis application

**※Training manual how to use the side of the fault diagnosis please refer.**

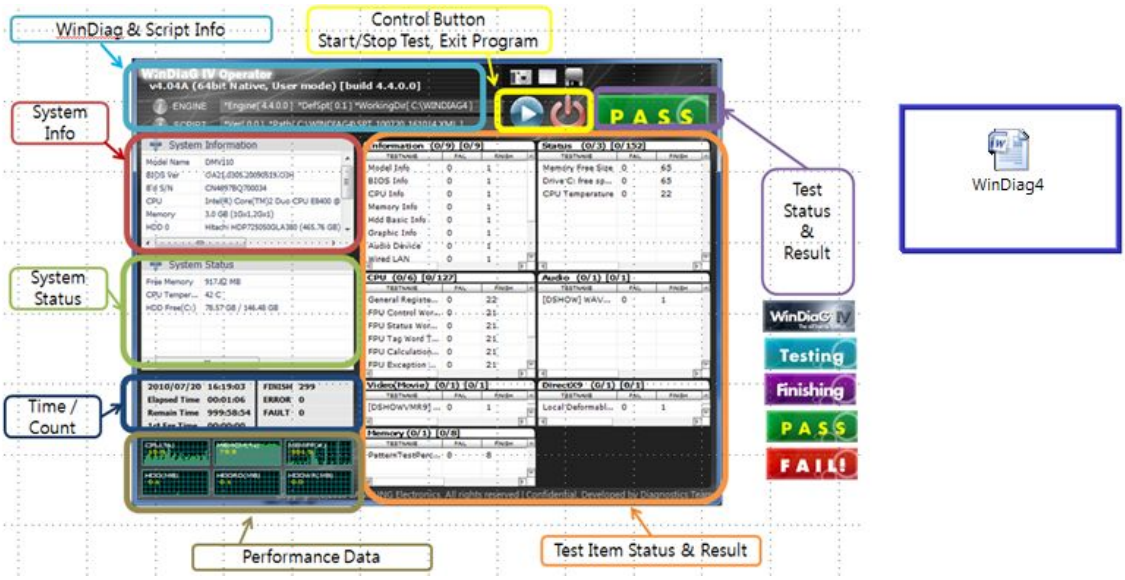
**WinDiag4**

1) WinDiag4 is a Diagnostic tool that tests overall computer's H/Ws and functions for Windows 7.

2) Precondition : UAC(User Account Control) should be disabled.

3) Installation : When you double-click SvcDiag.bat file, this program will be installed in C:\WinDiag4. After installation, WinDiag4 will automatically start testing the system.

4) Uninstallation : After terminating the program, Just delete C:\WinDiag4 folder.




- : Group Info
  - It displays Group Item Name and Test Count. If there is any FAIL or FAULT in the Group Item, the color of title will be changed to Red.
- : Test Item
  - §It displays Test items included in this Group. If there is any FAIL or FAULT in this test item, the color of the test item will be changed to Red.

①
②
Status (2/7) [12/28]
Memory Free Size 0 6 0 0.11 06 n/a 015
Drive C: free sp... 0 6 0 0.08 06 n/a 016
CPU Temperature 0 2 0 0.02 01 n/a 017
FAN Status 1 1 0 1.51 02 n/a 018
HDD 0 Tempera... 0 2 0 0.34 n/a 019
Battery Status 11 11 0 0.04 02 n/a 020
Heating System 0 0 0 0.0 02 n/a 021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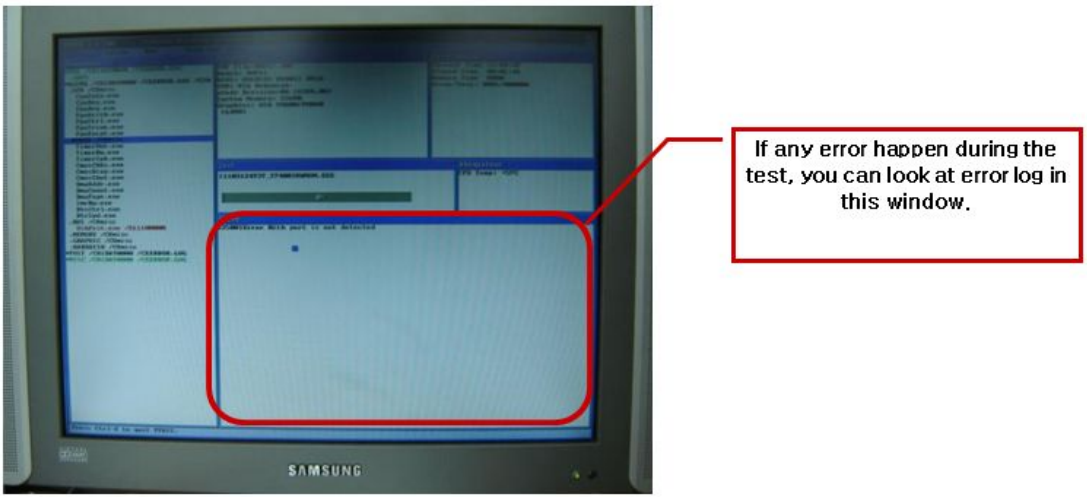
**※Training manual how to use the side of the fault diagnosis please refer**

**Pyxis**

1) Pyxis is a software that diagnose computer's H/W components in DOS environment.

2) How to use Pyxis

- First, make Dos bootable USB memory or CD.
- Copy all released files to the Dos bootable device.
- After you boot using the Dos bootable device, Select the menu that you want to execute.

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# 4.4. System Diagnosis

## System Diagnostics Card

The Diagnostics Card shows the system operations during the POST (Power On Self Test) in a 2 digit hexadecimal number by connecting the cable to the 10 pin connector below the PCMCIA slot after separating the Top part. The card is used to evaluate the reason for the malfunction without disassembling the system when the system malfunctions and to test if the system operates normally after replacing a defective FRU.

## Debugging Code

In general, if a defect of the circuit or part is detected during the system test, the system stops at a particular code.

The error codes for each part of the system are listed in the following table.

※ ※Please Refer to the Training manual chapter4.Trouble Shooting


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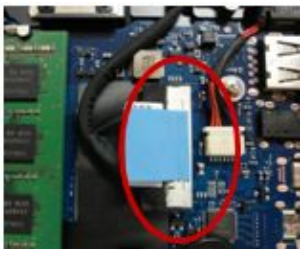
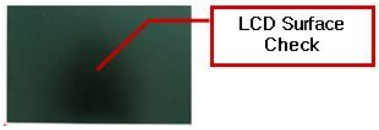
# 4.5. Hardware Troubleshooting

## 4.5.1. LCD

| 1. The screen is dark or the colors of the screen are distorted.. | | |
|---|---|---|
| 1 | Check the connection status<br>- LCD Cable on Main board side connector<br>→ Make sure Cable is inserted correctly |  |
| 2 | Check if there is a part of the LCD that is bent or broken due to impact.<br>→ Replace the front Ass'y |  |

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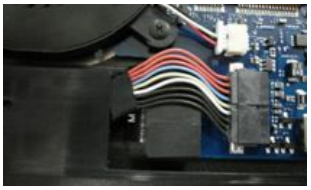
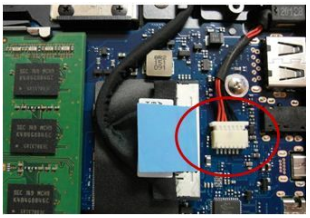
## 4.5.2. Problems related with Power

| | | |
|---|---|---|
| **1. The system cannot power on** | | |
| 1 | Check if the adaptor is plugged in. Battery might be in shipping mode. | |
| 2 | Check if DC Cable is plugged in correctly. |  |
| 3 | Check if battery is plugged in correctly. | |
| 4 | Check Riht Sub-FPC connection. | |
| 5 | Change Right Sub-FPC or Sub board | |
| 6 | Check BIOS ROM status using debugging card<br>→ If BIOS ROM is NG, change main board | |
| **2. the system does not boot or immediately turns off after being turned on.** | | |
| 1 | Since this may be a short circuit in the system | Disconnect the power immediately, disassemble the system and check if there are any conducting alien objects such as a screw inside. |
| 2 | Check the connection status between the CPU and the RHE. | |
| 3 | RTC Reset. | * Check if it is out of order. |
| 4 | Replace Main Board. | * Check if it is out of order. |
| **3. The system battery is not recharged.** | | |
| 1 | Check if DC Cable is plugged in correctly<br>→ If not, plug in the DC cable. |  |
| 2 | Check if Battery is plugged in correctly<br>→ If not, plug in the Battery | |
| 3 | Change DC cable | |
| 4 | Change DC cable | |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| | | |
|---|---|---|
| **4. The system can power on, but cannot boot into Windows** | | |
| 1 | Make sure no USB storage device is connected to the USB port | |
| 2 | If the 'Operating system not found'message appears during the booting process even though the SSD is recognized by CMOS, the operating system of the SD may be corrupted or the SSD is out of order. | Format the SSD and reinstall the operating System.<br>If problem persists, replace SSD |
| **5. The system can power on, but LED on power button does not lit up.** | | |
| 1 | Check if there is any material blocking the LED | |
| 2 | Change Power switch FPC | |
| 3 | Change Sub board | |

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## 4.5.3. Others

| | | |
|---|---|---|
| **The system does not recognize USB devices** | | |
| 1 | Make sure the USB device receives enough power (some USB devices need external power source) | |
| 2 | Check USB FPC connection on main board. Change if necessary | |
| 3 | Replace main board | |
| **TP function is abnormal, or does not work** | | |
| 1 | Try checking PS/2 Port Touch pad driver in control panel | |
| 2 | Make sure TP cable&PCB is connected | |
| 3 | Change front Ass'y | |
| **KBD function is abnormal, or does not work** | | |
| 1 | Try checking KBD driver in control panel | |
| 2 | Check lighting of Caps Lock & WLAN LED | |
| 3 | Check KBD FFC & KBD backlit FPC connection | |
| 4 | Check bios setting | |
| 5 | Change main-board | |
| **Camera function is abnormal, or does not work** | | |
| 1 | Check device manager and make sure camera driver (under imaging devices) is loaded correctly | |
| 2 | Check LCD cable connection | |
| 3 | Change LCD assy | |


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| Problems related to sound | | |
|---|---|---|
| **1. There is no sound from the speaker.**<br>**(Insert the figure of the audio jacks so that the reader can check via the figure.)** | | |
| 1 | Check if the sound is muted after booting up Windows. | |
| 2 | Control panel confirmation.<br>→ Speaker Setting. | |
| 3 | Check the connection status of the speaker cable and check if the speaker is out of order. | |
| 4 | Check if there is a magnetic object near the speaker. | |
| 5 | Replace Speaker. | * If there is still no function, change main + sub board |
| **2. There is no sound from the headphone/mic.** | | |
| 1 | Check if the sound is muted after booting up Windows. | |
| 2 | Control panel confirmation.<br>→ Speaker Setting. | |
| 3 | Check main board around audio connector.<br>Check for any short circuit or soldering NG. | |
| 4 | Change main board | |

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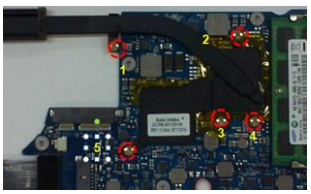
| | | |
|---|---|---|
| **HDMI port does not work normally.** | | |
| 1 | System manager confirmation .<br>(Video / Sound / Controller confirmation)<br>→ HDMI driver Re-install. | |
| 2 | Check the Display Manager work normally.<br>→ Display Manager program Re-install. | |
| 3 | Check the Control panel .<br>→ Check HDMI section enable. | |
| 4 | Replace Main Board. | |
| **AP (WLAN) or B / T devices can not connect.** | | |
| 1 | If the driver loaded correctly, check in Device Manager. | When loaded, AP signal is strong confirmation.<br>Make sure that the BT unit power. Or Check the connection to another host. |
| 2 | Wireless antenna connection or check the status of damage. | Antenna change |
| 3 | Wireless Lan module connection or check the status of damage | Change Wireless LAN module |
| 4 | Check wlan module connector damage | |
| 5 | Main-board change | |
| **The system temperature is too high.** | | |
| 1 | Check the system by using SAFC(Samsung Advanced Fan Control)program. | * Tool Program reference |
| 2 | Check the connection status of Heat sink<br>→ Screw 5EA |  |
| 3 | Check the connection status of FAN<br>Screw 4EA (R/L each 2EA) | |
| 4 | Replace FAN | * Check if it is out of order. |
| 5 | Replace RHE | * Check if it is bent. |
| 6 | Replace Main Board. | * Check if it is out of order. |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# 4.6. CPU FAN Control

1) Normal Mode (AC)

| Turbo boost setting (Huron River) | | |
|---|---|---|
| PL1 | TDP | 0 |
| PL2 | 125 * TDP | 0 |
| Tau | 28 | 28 |
| T_cc | 90 | 10 |

| CPU SPEED | | Address (Hexa) | RPM | Noise | (for CPU temperature) CPU Sensor(on/off) | (for GPU temperature) GPU Sensor(on/off) | Speed step & throttling |
|---|---|---|---|---|---|---|---|
| Step 1 | OFF | FF | - | | - | - | NORMAL |
| | Low | 70 | 2194 | | 40/35 | | |
| | Middle1 | 5B | 2701 | | 55/50 | | |
| | Middle 2 | 4D | 3192 | | 65/60 | | |
| | Middle 3 | 42 | 3724 | | 70/65 | | |
| | Middle 4 | 37 | 4468 | | 75/70 | | |
| | High | 2C | 5585 | | 83/78 | | |
| Turbo Off | High | 2C | 5585 | | 93/85 | | |
| Step 2 | High | 2C | 5585 | | 95/85 | | Lowest Speed step |
| | | OS Throttling | | | 97 | | Additional 50% throttling |
| | | OS Shutdown | | | 99 | | |
| | | Dos Throttling | | | 95/90 | | Addtional 50% throttling |
| | | Shutdown | | | 99 | | |

2) Normal Mode(Battery)

| CPU SPEED | | Address (Hexa) | RPM | Noise | (for CPU temperature) CPU Sensor(on/off) | (for GPU temperature) GPU Sensor(on/off) | Speed step & throttling |
|---|---|---|---|---|---|---|---|
| Step 1 | OFF | FF | - | | - | - | Turbo Off |
| | Low | 70 | 2194 | | 55/45 | | |
| | Middle1 | 5B | 2701 | | 65/55 | | |
| | Middle 2 | 4D | 3192 | | 70/65 | | |
| | Middle 3 | 42 | 3724 | | 75/70 | | |
| | Middle 4 | 37 | 4468 | | 80/75 | | |
| | High | 2C | 5585 | | 85/80 | | |
| Step 2 | High | 2C | 5585 | | 95/85 | | Lowest Speed step |
| | | OS Throttling | | | 97 | | Additional 50% throttling |
| | | OS Shutdown | | | 99 | | |
| | | Dos Throttling | | | 95/90 | | Addtional 50% throttling |
| | | Shutdown | | | 99 | | |

3) Silent Mode

a) Silent Mode(Auto_on/off)

| CPU SPEED | | Address (Hexa) | RPM | Noise | (for CPU temperature) CPU Sensor(on/off) | (for GPU temperature) GPU Sensor(on/off) | Speed step & throttling |
|---|---|---|---|---|---|---|---|
| 2 Step | OFF | FF | - | | - | - | Lowest Speed step |
| | Low | 70 | 2194 | | 55/45 | | |
| | Middle1 | 5B | 2701 | | 65/55 | | |
| | Middle 2 | 4D | 3192 | | 70/65 | | |
| | Middle 3 | 42 | 3724 | | 75/70 | | |
| | Middle 4 | 37 | 4468 | | 80/75 | | |
| | High | 2C | 5585 | | 85/80 | | |
| | | OS Throttling | | | 97 | | Additional 50% throttling |
| | | OS Shutdown | | | 99 | | |
| | | Dos Throttling | | | 95/90 | | Addtional 50% throttling |
| | | Shutdown | | | 99 | | |

b) Silent Mode (Low)

| CPU SPEED | | Address (Hexa) | RPM | Noise | (for CPU temperature) CPU Sensor(on/off) | (for GPU temperature) GPU Sensor(on/off) | Speed step & throttling |
|---|---|---|---|---|---|---|---|
| 2 Step | OFF | FF | - | | - | - | Lowest speed step |
| | Low | 70 | 2194 | | 55/30 | | |
| | Middle1 | 5B | 2701 | | 65/55 | | |
| | Middle 2 | 4D | 3192 | | 70/65 | | |
| | Middle 3 | 42 | 3724 | | 75/70 | | |
| | Middle 4 | 37 | 4468 | | 80/75 | | |
| | High | 2C | 5585 | | 85/80 | | |
| | | OS Throttling | | | 97 | | Additional 50% throttling |
| | | OS Shutdown | | | 99 | | |
| | | Dos Throttling | | | 95/90 | | Addtional 50% throttling |
| | | Shutdown | | | 99 | | |

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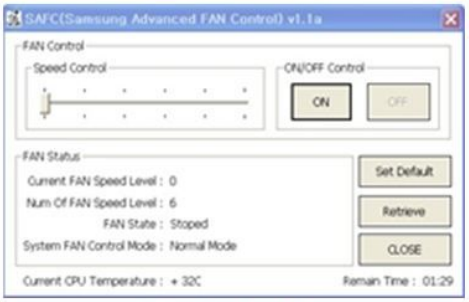
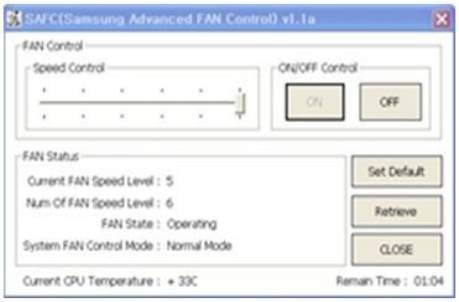
**CPU Fan Control**

- One can turn the fan on & off and check the fan's operational conditions without system disassembly.




그림(1) Fan off 상태




그림(2) Fan on 상태

- SAFC's default setting is "Fan off" or "Minimum Fan Speed".

- Press "ON" in "ON/OFF Control" Fan is turned on to maximum fan speed.

- Press "OFF" in "ON/OFF Control" Fan returns to default setting.

- Fan Voltage Measurement
  - Read Fan RPM indicated in SAFC.
- Fan Voltage Pass/Fail determination
  - If Fan RPM satisfies "rpm spec +/-10%", then Fan test is "PASS" .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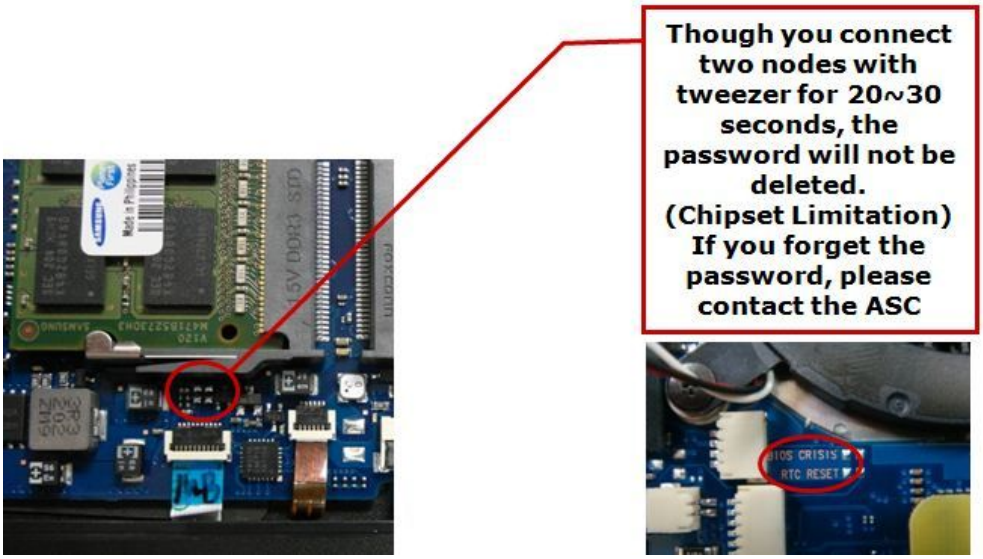
# 4.7. Other

### RTC Battery Reset

- The system apart and remove the battery.
- Remove the RTC battery
- Using the tool like as tweezer, connect two nodes for about 20~30sec.
- Then Bios rom will be reseted.


Though you connect two nodes with tweezer for 20~30 seconds, the password will not be deleted.
(Chipset Limitation)
If you forget the password, please contact the ASC
BIOS CRISIS
RTC RESET

### Check the battery use environment

1) Generally, the battery usage time in advertisements by notebook manufacturers refers to the maximum battery use time. Since the system specifications and the usage environment may differ, the user's battery usage time may differ from the advertisement even if there is no problem with the system.

2) Conditions for the company's maximum battery use time
   a) Minimum LCD brightness, base system, the wireless LAN R/F is turned off, BatteryManager-Maximum Battery Mode
   b) Measuring Tool: BatteryMark v.4.0.1

3) If a customer complains about the battery usage time, let them know that the battery usage time may differ depending on the model specifications and the usage environment and recommend the following usage environment for longer battery time.
   a) Use the company's power-saving program, BatteryManager, and set BatteryManager to Maximum Battery Mode.
   b) LCD brightness: Set to the minimum level as long as the user does not experience inconvenience.
   c) Disable unnecessary devices
   d) Turn the wireless LAN R/F switch off and disable USB devices (DMB, fingerprint recognition and Bluetooth)

**► Refer to attachment The method of Battery check.**

※ Please Refer to the Training manual chapter4.Trouble Shooting.

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# 4.8. H/W Upgrade

### HDD Upgrade

**SSD Decomposition**
: Remove the 1 screws to disassemble the SSD.

| | | |
|---|---|---|
| BA59-03340A | SSD_128G_SEC | 128GB,MZMPC128HBFU-000KN,S63,H16,D16385,3.75mm,mSATA,SATA,MLC SSD,SATA3 |
| BA59-03339A | SSD_256GB_SEC | 256GB,MZMPC256HBGJ-000KN,S63,H16,D16385,3.75mm,mSATA,SATA,MLC SSD,SATA3 |
| BA59-03232A | SSD_128G_Sandisk | 128GB,SDSA5DK-128G-1004,S63,H16,D16385,3.2mm,30*51mm,SATA,mSATA, MLC |
| BA59-03233A | SSD_256GB_Sandisk | 256GB,SDSA5DK-256G-1004,S63,H16,D16385,3.2mm,30*51mm,SATA,mSATA, MLC |


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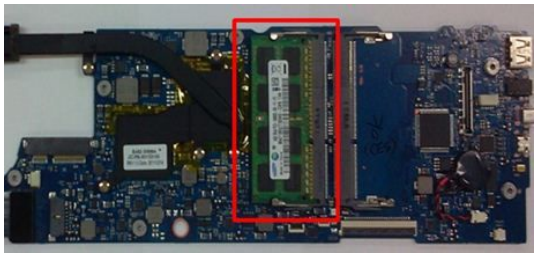
## Memory Upgrade



**Memory**

**: Pull two hooks on the side to remove memory module.**

| | | | |
|---|---|---|---|
| 2GB MEMORY | M471B5773CHS-CH9,DDR3 2G SODIMM,2GByte,256Mx64bits,SODIMM,204P,67.6x30.00mm,-,1.5V,+-0.075V,0to95C,280mA,TR | 1105-002217 | SEC |
| 2GB MEMORY | M471B5773DH0-CH9,DDR3 2G SODIMM,2GByte,256Mx64bits,SODIMM,204P,67.6x30mm,8ns,1.5V,+-0.075V,0to+95C,280mA,TR | 1105-002224 | SEC |
| 4GB MEMORY | M471B5273DH0-CH9,DDR3 4G SODIMM,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,8ns,1.5V,+-0.075V,0to+95C,320mA,TR | 1105-002209 | SEC |
| 4GB MEMORY | M471B5273CH0-CH9,DDR3 4G SODIMM,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,8ns,1.5V,+-0.075V,0to+95C,320mA,TR | 1105-002211 | SEC |
| 4GB MEMORY | M471B5273CM0-CH9,DDR3 4G 1333MHz,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,255ps,1.5V,+-0.075V,0to+95C,1120mA,TR | 1105-002294 | SEC |
| 2GB MEMORY (1600MHz) | M471B5773DH0-CK0,DDR3 2G 1600MHz,2GByte,256Mx64bits,SODIMM,204P,67.6x30mm,225ps,1.425V~1.575V,+-0.075V,0to+95C,160mA,TR | 1105-002328 | SEC |
| 4GB MEMORY (1600MHz) | M471B5273DH0-CK0,DDR3 4G 1600MHz,4GByte,512Mx64bits,SODIMM,204P,67.6x30mm,225ps,1.425V~1.575V,+-0.075V,0to+95C,320mA,TR | 1105-002327 | SEC |

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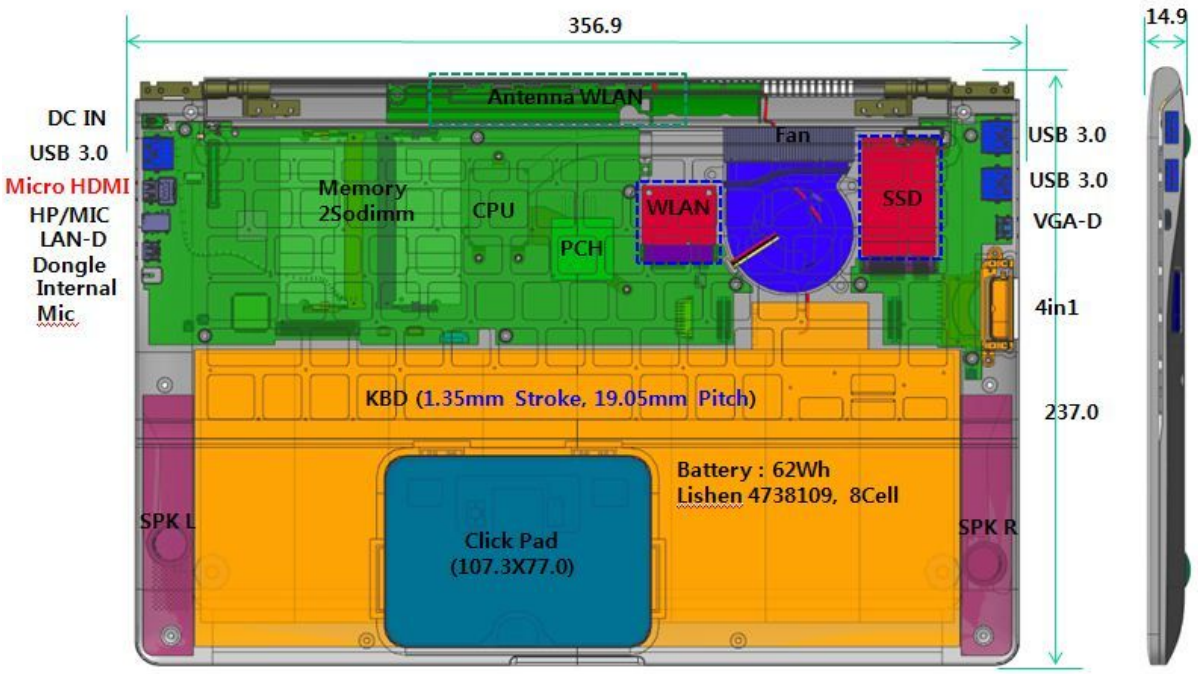
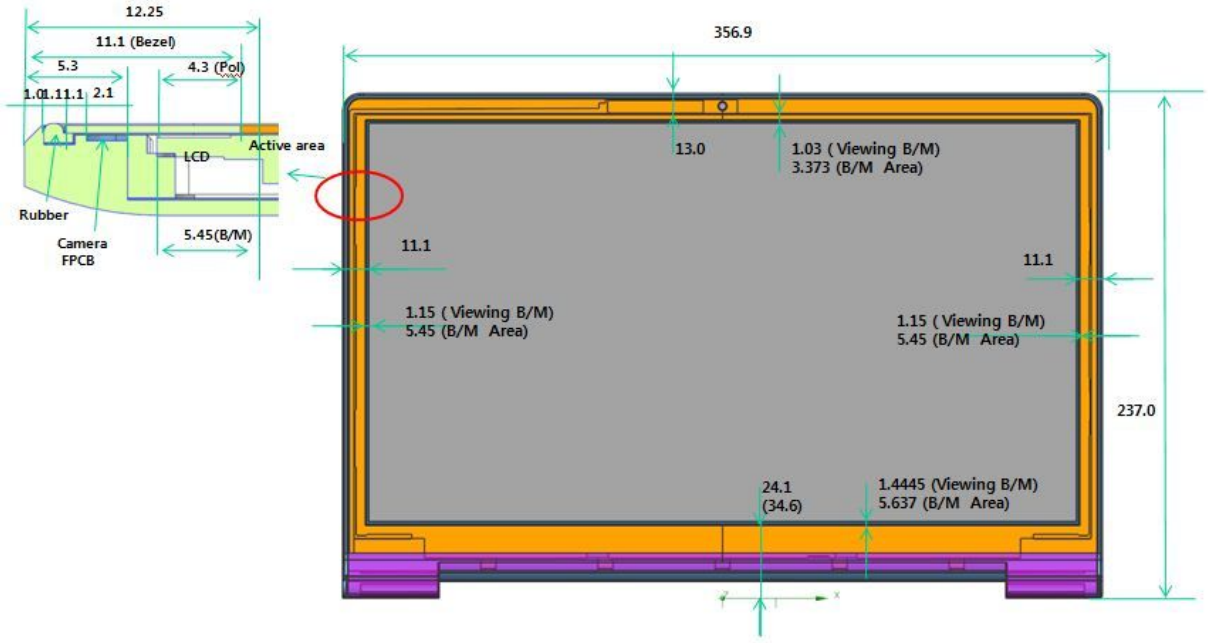
# 5. System Wire Diagram

## 5.1. System Layout

### 1. System Layout




### 2. LCD Layout





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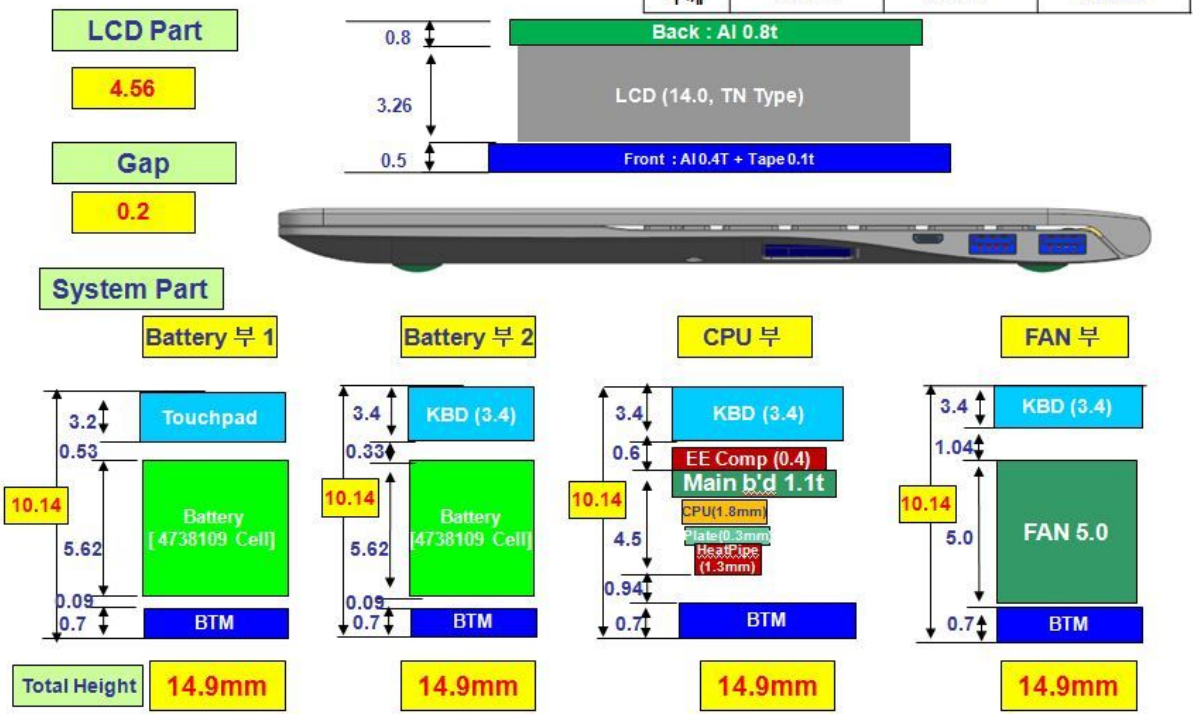
## 3. Height Simulation

| | Mac Air 13.3" | A-pit 13 | A-pit 14 |
|---|---|---|---|
| 두께 | 3~17mm | 12.9mm | 14.9mm |




## 4. KBD

KR

US

UK

○ : KBD Water Check sheet Location

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# 5.2. System Component

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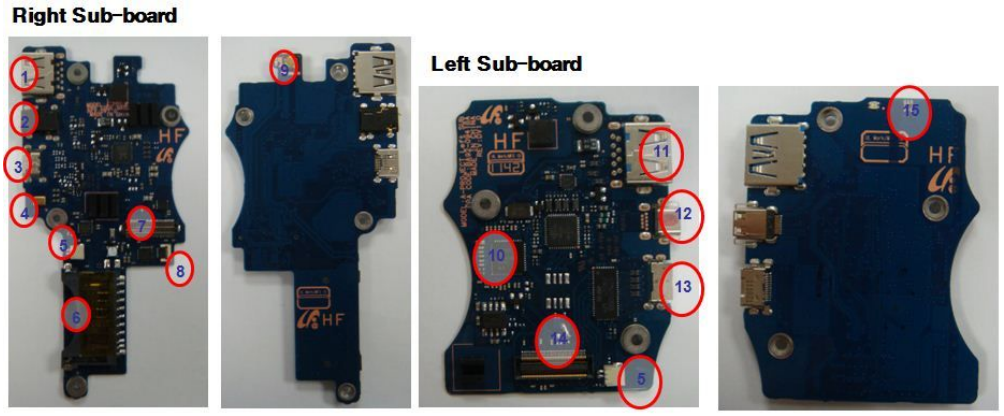
# Board Component — Top

1. ALS sensor
2. Audio chip

# Board Component- Bottom




1. CPU
2. PCH
3. SODIMM Memory connector
4. WLAN mini card
5. 60pin B2B connector (Sub-board to main-board)
6. RTC battery
7. Touch pad connector
8. Battery connector
9. DC in cable connector
10. LCD connector
11. KBD connector
12. TPM
13. Micom
14. Keyboard Backnit connetor
15. Fan connector
16. BIOS ROM
17. USB 2.0 connector
18. Audio combo jack
19. m-HDMI connector
20. LAN dongle connector
21. Speaker connetor(left)
22. Mic chip

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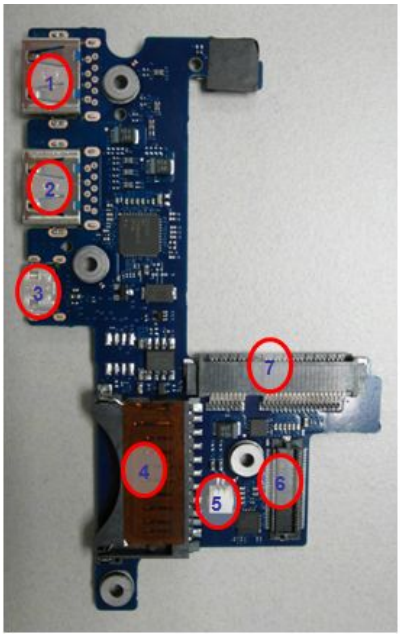
# Board Component- Sub BD



1. USB 3.0 connector
2. USB 3.0 connector
3. VGA dongle connector
4. 4 in 1 socket
5. Speaker connetor(right)
6. 60pin B2B connector
   (Sub-board to main-board)
7. SSD connector
8. Power S/W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## GSPN (GLOBAL SERVICE PARTNER NETWORK)

| Area | Web Site |
|---|---|
| Europe, MENA, CIS, Africa | https://gspn1.samsungcsportal.com |
| E.Asia, W.Asia, China, Japan | https://gspn2.samsungcsportal.com |
| N.America, S.America | https://gspn3.samsungcsportal.com |

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